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BIRDS OF WESTERN CANADA

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Greetings.
P. A. Taverner
A.O.U. Oct. 12, 1926.

Presented to Mrs C. B. Graves
on the occasion of the 44th Stated Meeting of the
American Ornithologists' Union
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with the Compliments of the
Honourable Charles Stewart
Minister of Mines

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HR

Canada
Department of Mines
Hon. CHARLES STEWART, Minister
CHARLES CAMSELL, Deputy Minister

Victoria Memorial Museum
L. L. BOLTON, Acting Director

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BIRDS OF WESTERN CANADA

BY

P. A. Taverner

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Birds of Western Canada

INTRODUCTION

OBJECT OF THE BOOK

Of late years there has been a great awakening of interest in the subject of natural history. More and more people are beginning to realize the pleasure and profit that can be derived from observation of common natural objects. In this growing field of nature study, few subjects have attracted so much popular attention as birds, and few forms of life appeal so strongly to the æsthetic sense. They are beautiful; they arouse curiosity; their elusiveness piques the imagination; and by constantly presenting new aspects they escape becoming commonplace.

The ornithological side is one from which the problems of nature may be successfully attacked from so many standpoints and in so many ways that there is interesting and valuable work for all to accomplish according to individual taste or opportunity. Those who incline towards systematic work may split their definitions as finely as human powers of observation permit. The animal psychologist can develop his problems as far as ingenuity can devise methods for experimentation. The ordinary nature lover can observe and note as painstakingly as opportunity permits; he may record information of scientific as well as popular interest, take pleasure in observing passing beauties, train his powers of observation, and acquire a knowledge that greatly increases his capacity for appreciation of nature. Even the unsentimental, practical man, who has little outward sympathy with abstract beauty, has his attention attracted by the evident economic value of birds.

"Birds of Western Canada" has been written to awaken and stimulate an interest, both æsthetic and practical, in the study of Canadian birds; to suggest the sentimental, scientific, and economic value of that study; to assist in the identification of native species; to furnish the economist with a ready means of determining bird friend from bird foe so that he may act intelligently towards them and in the best interest of himself and the country at large; to present in a readily accessible form reliable data upon which measures of protective legislation may be based; to point out some of the pitfalls that have caught the inexperienced in the past; and to suggest methods for their future avoidance.

SCOPE OF THE BOOK

This work covers all the birds known to occur in Canada from the Ontario-Manitoba boundary line to the Pacific coast. It is complementary to "Birds of Eastern Canada"[1] and with it forms a popular manual of the birds of the Dominion. Owing to the fact that there were a number of books describing eastern birds with considerable degree of detail and exactness, "Birds of Eastern Canada" was not intended to be an absolutely complete check-list of eastern birds and a number of rare and casually occurring species not likely to be seen by the ordinary observer were omitted from it or mentioned with little detail. On account of the lack of authoritative supplementary books on birds of the west, however, it has been deemed advisable to be more comprehensive in this volume. All species known to occur in western Canada have been included and all have been described with greater detail and exactness. Undoubtedly the large number of figures in the text will add considerably to the practical value of the work.

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[1] Taverner, P. A., "Birds of Eastern Canada": Memoir 104, No. 3 Biological Series, Geological Survey, Department of Mines, Ottawa, Canada.

PLAN OF THE BOOK

The systematic arrangement (*See* Classification, page 4, and Nomenclature, page 6) used is that of the American Ornithologists' Union Check-list of North American Birds, 3rd edition, 1910, with the supplements of 1912, 1920, and 1923 as published in the "Auk" (*See* page 20). Although this arrangement is acknowledged to be faulty and on the point of being considerably altered, it has seemed best, in a work of this kind, to adhere to it and keep in agreement with the majority of current and past American ornithological literature rather than to endeavour to make improvements that may be out of harmony with the works of both past and future authorities.

Although the scientific nomenclature and taxonomy of the check-list have been followed closely, certain variations from the vernacular adopted therein have been made. These, however, are not serious and need cause no confusion. They consist mostly in the application of English names to the *species*. That this has, in some cases, necessitated the transference of the check-list name of the type or first described subspecies to the more inclusive unit is regrettable, but it seems inevitable if we are to express true and logical relationship in the vernacular nomenclature. The fact is that certain scientific concepts have outgrown the traditional means of their popular expression. The original concept was of a species and its dependent subspecies as separate entities. The modern one is of a species *composed* of co-ordinate subspecies. Under the earlier idea the form first described and named was regarded as the species; later discovered ones were viewed as subordinate subspecies departing therefrom. Thus we had the Song Sparrow, meaning thereby only the eastern race of Song Sparrows and regarding it as the species. The other races, the Dakota Song Sparrow, the Rusty Song Sparrows, *et al*, were inferior subspecies. This, too, in spite of the self-evident facts that all these are equally Song Sparrows of co-ordinate rank; that a first description confers no particular taxonomic patent of superiority; and that the form accidentally discovered first is in reality no more than one of the races of Song Sparrows which for historical and other convenience only, we designate the "type race." It is in fact only the eastern race of a widespread species of Song Sparrow. Under the more modern concept, all subspecies combine to form the species, which thus may be a group of subspecies the name of which should not be limited to any one of its component parts. The current edition of the check-list has well presented this in the scientific nomenclature, but has failed to adapt to it the vernacular system, which remains under the older and discarded concept.

In "Birds of Western Canada" it has been the aim to present, in the English or vernacular names, as accurate a relationship between species and subspecies as is in vogue in the scientific nomenclature, and to reduce to their relative taxonomic importance those minor subspecific differences that an earlier treatment has unduly emphasized.

It would be too much to expect that the result attained will satisfy everyone: the writer hopes, however, that it will be accepted until the American Ornithologists' Union committee take the matter up and make authoritative decisions.

In the following pages the number and vernacular name, which have been taken from the American Ornithologists' Union Check-list and modified as little as possible, appear first as a specific heading in heavy type. Following, in smaller type, are the more common local names by which the species is, or has been, known in various localities.

The latin specific name follows in italics and is always binomial.

In the treatment of subspecies, species have been treated as aggregations of subspecies, each of equal rank and importance, and not, as is customary, as species with subordinate subspecies dependent upon them. The species is first given as a whole, including its subspecific races, and, under a subhead, mention is made of the special subspecies that occur within the geographical scope of the work.

Preceded by the initial "L" the length of the species is next given in inches and decimals of an inch. The length of a bird is determined by measuring it, in the flesh, in a straight line from the tip of the bill to the end of the longest tail feather, the bird being stretched only enough to straighten the neck curves. The measurements given are those of the average adult male and indicate the comparative size of the species under consideration. They are not usually for specific identification, as in most species there is more or less individual and sexual variation.

Only an outline description of species is given, and where there are illustrations the description is omitted and the reader is referred to the illustration.

Under "Distinctions" an attempt is made to bring out the salient points by which the species, when in hand, may be separated from other similar forms. In this the work of other authorities has been freely drawn upon to supplement the writer's observations. Many of the distinctive points are naturally only superficial, but all are, as far as possible, reliable.

Under the head "Field Marks" the features by which the species may be recognized in life are mentioned. In these the writer has been guided largely by his own experience and has stated the points that seem to him most characteristic. In species with which he has had little experience in life he has relied upon other authorities.

"Nesting" is merely a brief description of the nest and its situation. Much of this is drawn from other authors.

Under "Economic Status" is given a summary of present knowledge of the species in their relation to man. Most of this is drawn from the admirable work done by the United States Biological Survey. Of necessity only a brief outline of the data upon which conclusions are founded can be given, and the reader is referred to Ornithological Literature, on page 17, for greater details.

Under "Distribution" it has been deemed best to give the distribution in such general and well-understood terms that all may get at least a general conception of the ranges of the species. The result may be a little vague owing to the lack of sharply-defined boundaries of the ranges, but the centres of distribution are made clear. For definite ranges the reader is referred to the "Catalogue of Canadian Birds" by John and James M. Macoun, issued by this department in 1909.

In the paragraphs in larger type as many facts of general interest relating to the species have been included as the importance of the species warrants. In the descriptions of the various species are discussions of numerous matters and statements of general laws governing zoological life are made. Many of these apply to a number of species and some might well be included under each specific heading were it not for the constant repetition that it would necessitate. An attempt has been made to encourage a wholesome protective attitude from æsthetic, humane, and economic points of view without over emphasizing any of them.

Throughout it has been the endeavour to avoid the use of technical terms, substituting familiar words wherever possible. Some technical terms, however, have no general vernacular equivalent and a glossary of these is given on page 353.

ACKNOWLEDGMENTS

The writer wishes to acknowledge valuable assistance received in the course of his work from the following sources:

Major Allan Brooks, who has not only made most of the excellent coloured illustrations but has been a constant source of inspiration and, information to the writer. He has read over the entire manuscript and, owing to his wide experience and accurate knowledge of western birds, has been able to supply much valuable information. It is only just to him to say that he does not always agree with the writer in the taxonomic views presented.

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CLASSIFICATION

The first step in any science is that of classification. The present system of generic grouping of species was first advanced by Linnæus in his epoch-making "Systema-Naturæ" and has since been followed consistently by zoologists. By this, species are grouped together in *genera* according to fundamental structural relationships and not accidental resemblances. The fact that upon the discovery of the laws of evolution these relationships were found to agree with lines of descent proved the logic of the system and gave it an added meaning. Thus the various specific members of a genus may be conceived as having descended from a common specific ancestor; the genera of a family from a common generic one, etc.

Dealing only with existing North American birds, they may be divided into a number of *Orders*, which are the largest groups with which the Canadian ornithologist has direct concern. Orders are divided into *Families*, Families into *Genera*, and Genera into *Species*. These divisions may be again subdivided into *Suborders*, *Subfamilies*, *Subgenera*, and *Subspecies* whose positions in the scheme are evident from their titles.

Though the limitations of book construction necessitate the presentation of the classification scheme as a linear succession of forms following one another in single file, it should be borne in mind that the system is not linear in conception. The component species, instead of following a single line of relationship and sequence from the lowest to the highest, present many parallel or divergent lines of equal or subordinate rank. The class *Aves* or Birds may be represented by a tree, the height of the tree representing time in geological ages from the earliest at the bottom to the present near the top. The trunk should be shown as double at the base; one stem would be a short, dead stump and would represent the fossil, toothed birds which became extinct before present geological time; the other, large and thrifty, would represent the modern untoothed forms. This in turn would divide a short way from the base into two main branches to represent the two subclasses, the Raft-breasted and the Keel-breasted birds. The former would be represented by much the smaller branch, whereas the latter would divide and subdivide into branches representing first, orders; next, families; then, genera; and finally, species.

The value of these divisions—that is, the amount of differentiation sufficient to raise a group of genera to a family, or a collection of families to an order—is a matter for experienced individual decision, as there is no authoritative ruling upon the subject. However, there has gradually grown up an approximate agreement on this subject, though the constant tendency among specialists has been to make finer and finer distinctions and to multiply the number of the various groups.

The smallest division generally accepted is the *Species*. Though everyone has a more or less accurate conception of what a species is, whether it be called by that name or another, no satisfactory definition has ever been constructed for it. It is what is commonly known as a "kind of an animal." Thus the horse is a different "kind" or species from a donkey, a bluebird from a robin. They are sharply marked off from each other, regularly breeding only within the species and producing like species as offspring. Distinct species do not commonly interbreed; when they do so, they form crosses or hybrids that are usually sterile. Up to comparatively recent years no smaller division was recognized, but with intensive study of material it has become evident to advanced students that within the species there is considerable individual and geographical variation.

Individual variation is the natural difference that may occur at any time between members of common parentage such as amongst full brothers and sisters. Just as like begets like, so within certain limits like begets unlike, for no two creatures are ever exact duplicates. This individual variation, usually small and irregular in appearance and direction, but in some cases persisting progressively generation after generation in one direction, forms the successive steps by which present-day evolutionists explain the origin of new species. Individual variation, however, is disregarded in classification unless it has proceeded far enough to produce marked and constant differentiation over a definable natural group of a species.

Geographical variation may be regarded as the result of a common tendency to individual variation acting over a whole community of individuals tending towards a common goal, and is held to be induced and directed by local climatic and other conditions. Thus in many cases we find that within a widespread species all individuals inhabiting certain localities have characteristics that separate them from those of the surrounding areas. Individuals in a dry desert country are apt to be smaller and lighter in coloration, whereas those in a warm, moist country are usually larger and darker. These differences are in some cases marked and obvious; in other cases they are so slight as to be noticeable only by comparing large numbers of specimens and can be detected only by averages. Thus there is every degree of differentiation, due to geographical habitat, from pronounced departures from type, of almost specific value, to the finest shades of differentiation that skilled specialists can distinguish and which are inappreciable to the ordinary eye. The outstanding fact, however, that prevents the most marked geographical variation from full specific standing, is that these minor forms intergrade so that in intermediate localities every shade of differentiation between the extremes can be found. Between species this gradual merging of character is not supposed to occur, and however fine the distinctions may be, the divisions should be sharp and defined. We, therefore, recognize these intergrading variations due to or based upon geographical distribution as Geographical Races, Varieties, or Subspecies, the last term being now the most usual, and we regard them as species in the making before the connecting stages binding them to the original stock have, owing to the increasing sterility between the variants, disappeared. Except in such rare cases of physical isolation, as where an oceanic island habitat precludes continuous distribution, we take, in practice, the existence of intergrades as the evidence of subspecific status. Besides these divisions of taxonomic value there are a few other variants that, owing to their erratic occurrence, cannot be recognized in our classification. These are "Albinos," "Melanos," and "Dichromatic Forms."

GEOGRAPHICAL RACES

Subspecific varieties are divisions of the species and, except in special lines of work, or where special exactitude is necessary, are of minor importance. As these subspecies are also in many cases based upon points of difference perceptible to only the most experienced observers, they are mainly outside the sphere of interest of the average amateur observer.

NOMENCLATURE

Every North American bird has a common or vernacular name authorized by usage and recognized by the leading ornithologists, and there is seldom necessity for the scientific nomenclature in ordinary use. However, it is well for all who are interested in birds to familiarize themselves with as many of the scientific names as possible, as they are not only essential in more advanced work but they are of practical use in grasping the general relationships between various species. They are a necessity for international scientific intercourse and familiarity makes them much less forbidding than they seem at first. The ease with which such scientific names as geranium and hippopotamus, to say nothing of Junco and Vireo, have glided into popular usage shows that they are not as difficult and awkward as they appear on paper.

The present binomial system of nomenclature was introduced by Linnæus, the great Swedish botanist, and embodied in his "Systema-Naturæ," tenth edition, 1758, which is the authority accepted by American ornithologists. In this system each species is given a double name, the first term being that of the genus to which it belongs, the second that of the species. Generic names are not duplicated within the sphere of zoology nor are specific names within the genus. Thus, the American Robin is *Planesticus migratorius*, that is, that species of the genus *Planesticus* which is named *migratorius*. Other species of *Planesticus* have other specific names.

The three objects of scientific nomenclature are exactitude, universality, and permanence. To this end the naming of zoological material is subject to strict laws whose principles are universally accepted and applied according to strict codes. Under these laws the scientific name of a species is not a matter of personal preference, but is fixed, so that few or none can dispute it, and no changes can be made in scientific nomenclature except such as are necessary to correct current mistakes in the application of the laws of the code. With increased knowledge it has become necessary to depart slightly in letter, though not in spirit, from the strict binomial system of Linnæus, and by adding a third term as name of the subspecies to make it a trinomial one. Wherever a three-term name is used, it is that of a subspecies of the original binomial form. The first specimen described, or the first specimen to which a name has been attached, is regarded as the so-called "Type" form. Therefore, in dividing a species into subspecies the form which was first named as a species is automatically given precedence and its subspecific name is formed by a repetition of its specific name. Thus the American Robin that was first described and specifically named by Linnæus in 1766 as *migratorius*, when mentioned subspecifically in distinction from the Southern Robin or the Western one becomes *Planesticus migratorius migratorius*. The Western Robin, first separated from it by Ridgway in 1877, was named by him as *Planesticus migratorius propinquus*, and the Southern Robin by Batchelder, in 1900, is *Planesticus migratorius achrusterus*. In practice, where the generic or specific names are evident from the context, it is customary to indicate them by initial, as *P. migratorius*, or *P. m. migratorius*.

GEOGRAPHICAL DISTRIBUTION

The broader facts of the geographical distribution of life are patent to the most casual observer. The primary divisions of distribution, the Tropics, Temperate, and Arctic zones, are obvious, but closer study shows that within these broad divisions minor and less obvious ones can be detected. In America, north of the gulf of Mexico, there are three life regions, roughly following the above, called the Tropic, the Austral, and the Boreal. These are subdivided into life zones each characterized by its own peculiar assemblages of plants and animals.

The Tropic region is sufficiently characterized by name and need be only mentioned.

The Austral region corresponds roughly to the popular geographical conception of the Temperate zone. It is divided into three life zones, the Lower Austral, the Upper Austral, and the Transition. The Lower Austral might be designated as subtropic and extends north including the gulf of Mexico and the south Atlantic states, but does not reach Canada. The Upper Austral is the first zone in which we in Canada are directly interested. In the east, it merely crosses the border on the Lake Erie shore and includes the famous Niagara fruit belt. In the west it touches our southern boundaries in Saskatchewan and perhaps adjacent parts of Manitoba and Alberta and penetrates into British Columbia along the southern fruit-growing valleys. The northernmost Austral or Temperate life zone is the Transition, which includes the greater part of the highly cultivated areas of Canada. In the central provinces it is practically co-extensive with the prairies, ceasing against the spruce forest of the north and the slopes of the mountains to the west. In British Columbia it follows up the warm interior valleys to the vicinity of the Canadian Pacific Railway track and along the coast in a narrow belt to a point opposite the head of Vancouver island, including also most of the east coast of that island.

The Boreal region is divided into Canadian, Hudsonian, and Arctic zones. The Canadian zone includes the coniferous forested region north of the Transition to the northern limit of practical cultivation. It sends intrusive fingers far north along Mackenzie valley and Peace river and up the west coast, including most of the immediate coast and islands of the Alaska Panhandle almost to Skagway. The Hudsonian zone is the more northern country of small shrubs and stunted tree growth and is generally unsuitable for agriculture. The Arctic zone includes the Barren-grounds north to the pole.

These life zones are based fundamentally on temperature and, under ideal physiographic conditions, would be determined by latitude. However, they are deflected from their natural east and west sweep by various conditions, the shielding effects of mountain ranges, the vicinity of large bodies of waters and warm or cold ocean currents, temperature of prevailing wind, and elevation. Hence the very irregular boundaries of these zones across our continent.

Elevation is an important factor in the distribution of life. Even in the tropics, the top of a mountain high enough will be of extreme arctic character with perpetual snow, and down its sides at their proper elevation will be found belts of the above zones. This is well exemplified in the mountainous region of British Columbia. The mountain tops may be of Hudsonian character, their peaks even Arctic, and the valleys between may descend to Canadian, Transition, or even Upper Austral. Consequently, the zones that on the level prairies are separated by hundreds of miles may, in this more rugged country, be within a few hours climb of each other. Also, scattered here and there in level country, elevations may produce islands of more northern associations in southern zones. Thus, close along the boundary in the Prairie Provinces, we find Turtle mountain and Cypress hills as Boreal islands surrounded by Austral lowlands; and a long, narrow tongue of Hudsonian zone following the main

Rocky Mountains back-bone south from northern British Columbia to across the boundary line.

Ocean currents, also, have an important effect on the climatic conditions of the shores adjoining them. The fact that Land's End in England, washed by the last energies of the warm Gulf stream, is in the same latitude as bleak Labrador, bathed by a cold Arctic current, well illustrates this. On the Pacific, the great Japan current sweeps against our coast and prolongs Canadian zone conditions as far north as the latitude of southern Greenland, and moderates the climate of southern Alaska and the far-flung Aleutian islands to a surprising mildness.

Besides these purely thermal controls of climate, there are other influences. Important amongst these is rainfall. The west coast, bathed in winds moisture-laden from the warm sea, receives a copious rainfall and the vegetation is luxuriant and almost tropical in its profusion. These rain-laden winds, however, are condensed by the cold peaks of the coastal range and pass on over to the interior robbed of most of their moisture. Hence the valleys of British Columbia and the prairie regions beyond are in some cases almost arid in character.

Other conditions are influential in affecting the distribution of bird life. The treeless prairies, with their dry uplands interspersed with myriads of shallow lakes and sloughs fed largely by the melting of the winter's snow and in many cases strongly alkaline, attract an entirely different class of birds than do the heavily forested woodland to the north or east, or the mountainous country farther west. Another source of differentiation in bird life has been the north and south trend of the great western mountain ranges, forming routes for free extent of range up and down the continent, but limiting it east and west. Many species cross these mountains without difficulty, but others find them an almost complete barrier to free dispersal. Their effect has been to populate the regions west of the Rocky Mountain range with many species that have never found their way east. These mountains have also had the effect of breaking up the country into numerous more or less isolated communities each with its own peculiar physical characteristics that have developed a large number of geographical or subspecific races. In consequence many species that show homogeneous characters from the Atlantic to the mountains break up into a number of special forms from the mountains westward.

Taking the eastern forms as typical in the ordinary acceptance of the word, comparable birds of the prairie are slightly smaller and considerably paler in coloration, whereas on the humid Pacific coast they are larger and much darker in colour. Through these influences, therefore, we find in the west many subspecies of eastern forms. Comparatively few species range unmodified across the continent, many are represented east and west by two or more subspecies showing greater or less differentiation, and in other cases they are replaced by closely allied species or are absent altogether.

In noting these faunal divisions, however, it must be remembered that as far as birds are concerned these associations have to be based entirely upon breeding individuals. Birds travel so widely and along so many devious routes in their migration, that they may pass through several faunal areas in spring and autumn though breeding in only one. Therefore, in determining the faunal zone to which any given area should be referred, such transients must be disregarded.

The following birds are representative of those that may be regarded as distinctive of each life-zone. All may not be entirely confined to these zones, but in them they reach the centre of their breeding abundance and, associated together, they give the dominant characteristics of the bird life. Nor may all these species occur throughout the faunal zone to which they belong; for instance, some Transition species of the prairies do not extend across the mountains into the Transition of British Columbia, and vice versa. The lists are merely suggestive and might be greatly extended.

Upper Austral—
- Sage Grouse
- Dickcissel
- Grasshopper Sparrow
- Chat
- Sage Thrasher
- Canyon Wren
- White-throated Swift

Transition[1]—
- Bobolink
- Baltimore or Bullock's Orioles
- Eastern or Spotted Towhees
- Catbird
- Brown Thrasher
- Eastern and Western Bluebirds
- Ferruginous Rough-legged Hawk
- Sprague's Pipit
- Chestnut-collared Longspur

Canadian—
- Brown-headed Chickadee
- Olive-backed Thrush
- Hermit Thrush
- Three-toed Woodpeckers
- Canada Jay
- White-throated Sparrow
- Slate-coloured Junco

Hudsonian—
- Fox Sparrow
- Northern Shrike
- White-crowned Sparrow
- Bohemian Waxwing
- Evening Grosbeak
- Pine Grosbeak

Arctic—
- Ptarmigan
- Snowy Owl
- Snow Bunting
- Gyrfalcon
- Lapland Longspur
- Leucosticte
- Eider Ducks

MIGRATION

The migration of birds, their periodical and seasonal appearance and disappearance, is one of the most obvious phenomena of nature. The fact that many birds disappear in winter is common knowledge and has attracted attention for ages. Though once regarded as a mystery, and still far from being thoroughly understood in many of its details, we are beginning to wonder less but admire more as accurate knowledge replaces vague speculation. Today, where most of our northern species spend the winter is known and many of the routes by which they come and go have been mapped. We know that on the whole they are governed by ordinary and well-known, though perhaps highly developed, senses and common every-day influences and not by the mysterious powers and instincts once ascribed to them.

The fundamental cause of migration is obviously the waxing and the waning of the food supply. Birds leave the northern land of their birth because there is no other way by which to avoid starvation. Many species can withstand extreme cold but none can go long without food, and though some bird food still remains in Canada throughout the winter, its amount is small and sufficient for only a limited population and even that supply rapidly decreases, or, to the north, is buried under deep snow. The cause of the southward migration in the autumn then is obvious, but why should a bird leave the soft climate and plentiful food supply in the south to brave dangerous travel and finally find itself in a land where retiring winter still lingers and the danger of starvation is imminent? Many ingenious explanations have been advanced to account for this: homesickness, hereditary memories of an ancient home that had endured through geological ages; the seeking of special food for nestlings, and insufficiency of nesting sites in the southern areas, have all been given as possible reasons. However, it is unnecessary to advance an extraordinary explanation when a simple one exists. If we remember that in the nesting season the bird population is increased many times by the birth of young; that though in winter there may be room for a considerable number of birds in the southern stations, the natural spring increase in population outgrows the supporting power of even that fruitful land; and that just at this critical time the whole northern temperate region is by the coming of summer thrown open to occupation with an abundance of food, the subject is mysterious no longer. In fact, it is only by migration that it is possible to use the supporting power of the temperate regions unless the birds fast or hibernate through the winters, to neither of which customs the avian nature takes kindly.

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[1] Most of the species of this zone also occur in the Upper Austral but reach their northern limit here. The occurrence of these, with the absence of the species mentioned as peculiar to the bordering zones, are the most marked characteristics of the Transition zone.

Though food supply is the fundamental or originating reason for migration we must look for other and more immediate impulses for an explanation of its methods today. Originally forced to and fro by hunger, the annual movements now have become instinctive and take place before the actual hunger pinch is felt, or the physical system weakened by want.

The extent of the migrations of the different species varies. A very few species do not, in the true sense of the word, migrate at all. In other species only the more northern individuals recede from their stations, the southern remaining almost stationary, though in the majority of Canadian species the whole body moves south. Though the general rule is that migrant birds move south in winter, some do it by rather indirect routes; others, although they make considerable geographic or climatic change in their situations, lose little or none of their northing in the process and winter at nearly as high a latitude as they summer. A few achieve milder climate simply by descending a mountain-side to the valleys. A number of the birds of the interior cross the mountain ranges at various points to the adjacent Pacific seacoast; others nesting nearby traverse in migration all the central provinces in a nearly easterly line, and winter on the Atlantic coast. The whole country is thus crisscrossed with aerial lines and each species is more or less a law unto itself as to the route and objective of its journey. The bird performing the greatest migratory journey is doubtless the Arctic Tern, a bird that nests from the gulf of St. Lawrence to the polar regions and winters as far south as the Antarctic continent.

The methods of migration are nearly as varied as their direction or extent. Some species drift along throughout the day from treetop to treetop, from wood patch to wood patch, gradually working their way in the desired direction. Others take long flights, some high in the air, some lower. Some travel altogether by day; others travel at night and we are aware of their passage only through accidental opportunities, their faint voices coming down to us from overhead in the darkness, or by their sudden appearance about us in the morning. They travel in flocks of single or mixed species, scattered groups, or as individuals.

Many species, if not all, follow more or less definite routes to and from their breeding grounds, and some go and return by altogether different paths. Comparatively small bodies of water deflect some species from their course, others unhesitatingly cross vast reaches of sea, indifferent to nearby and convenient land passages that are made use of by closely allied species. In some species the older birds precede; and in others the males precede the females.

How birds find their way is still only vaguely understood, and individuals far out of their natural range and course show clear evidence of being as hopelessly lost as any other animal would be on unfamiliar ground. Certainly experience has much to do with it and undoubtedly young birds are largely guided by the movements of their elders, who, presumably, through previous experience, already know and can lead the way. We can understand how birds can follow great landmarks—large river systems, mountain ranges, or seacoasts—in their journey, but no sense with which we are familiar explains how some species returns unerringly to lonely oceanic islands over wastes of monotonous sea. It may be that they have a special sense which aids them in orienting themselves.

PROTECTION

In food habits, birds are eminently adaptable: seeds, plants, fruit, insects, flesh, or fish are all acceptable to various species and, consequently, nearly all regions have their quota of appropriate birds. A bird lives fast, its heart beats more rapidly than that of other animals, the blood temperature is higher, and it consumes an enormous amount of energy in flight. This feverish heat and strenuous exertion require a correspondingly large amount of food; consequently the bird as an economic factor is one to be regarded seriously. Though it may be an exaggeration to say, as some writers have implied, that the whole balance of nature depends upon birds and that without them the country would be a barren waste with no life other than insects, yet birds cannot be seriously reduced in number without the gravest results. The destruction of tons of weed seeds and millions of insects must necessarily have a great influence upon human welfare and neglect of this fact must seriously react upon any community that fails to give proper protection to its birds.

However, the problem of the status of individual species of birds is not the simple thing that it superficially appears to be. More than a cursory examination is necessary and many things must be considered in order to arrive at the truth. Sometimes birds work in harmony with human welfare and sometimes against it. They may be directly beneficial at one season and harmful at another, or their indirect influence may alter the sum of their direct effects in a most surprising manner.

General impressions then as to whether a bird is beneficial or harmful require careful checking. Mere casual observation in life is never sufficient to determine even its food supply. Modern practice bases such conclusions almost entirely upon the examination of the stomach contents of wild birds taken throughout the year, which is the only evidence that is not subject to question. In this work the United States Biological Survey has examined and passed upon thousands of bird stomachs and the results of its researches are available to those who care to study and use them.

As one of the factors in the delicate balance of nature, birds should be respected.

There are certain birds which from their size, habits, and general food value are regarded as legitimate game. The pursuit of these is invigorating sport and tends to the healthful welfare of the sportsman, teaching woodcraft, hardihood, out-of-door adaptability, and marksmanship. The true sportsman has a code of ethics of his own founded upon economic as well as humanitarian principles. He shoots nothing without giving it a fair chance and little that cannot be used as food. He is also careful not to deplete the game upon which his future sport depends. True sportsmanship, however, has not been universal, and its too common absence has resulted in a gradual but steady depletion of our game. Restrictive measures have been enacted, but have usually followed rather than preceded the results that have made them necessary; the regulations that are enacted today should have been adopted yesterday and the consequence is that, over much of the country, game is a thing of the past.

This has been especially true in the east; the west is younger and its wild-life resources have not yet been so depleted, conservation sentiment has developed and it rests with the people whether they will follow in the footsteps of an older and more wasteful generation or see that their patrimony is handed to posterity undiminished. Probably no greater single act of conservation of wild life was ever inaugurated than when the Migratory Birds Convention Act with the United States was ratified in 1916 and the various provincial acts in harmony with it were enacted. Under this it was recognized that the protection of migratory birds was an international question, not a local one, as it is only by international agreement under federal auspices that we can be assured that protection equivalent to that extended in one country will follow migrant birds to other jurisdictions. Under this agreement migrant insectivorous birds, certain sea birds, Herons, Cranes, and all the Shore Birds or Waders except a definitely named few, are provided with absolute protection throughout the year in all parts of Canada and the United States. The shooting season for migratory game birds is definitely limited to not more than three and one-half months in any given locality and all spring shooting is abolished. A secondary effect, but probably of primary importance to the species concerned, has been the stopping of the sale of migrant game birds throughout the United States and over most of Canada. Under the enforcement of the terms of this treaty there has been a very decided increase in the number of birds of the species affected and it seems as if its continuation will provide for their permanent welfare.

Besides enforcing these treaty terms, a beginning has been made by both federal and provincial action in the establishment of wild-land reservations in addition to the National and Provincial parks already established. Not only will these areas give sanctuary, protection, and suitable living conditions in the midst of cultivation and settlement, but will act as reserves from which surplus native stock can overflow into adjoining country where agricultural and other development prevents its permanent occupation. Today, when swamps and sloughs are being drained, forests cleared, and grass lands hayed and pastured, this seems the only method by which we can retain much of the life that was originally distinctive of the country.

MEANS OF ATTRACTING BIRDS

To anyone interested in birds, the pleasure of having them about the house and garden, where they can be observed at leisure, is very great. A small garden patch can be made attractive to many species by proper methods. The effects of strict protection are well illustrated in some of the larger parks where the shyest waterfowl, finding there is nothing to fear from man, become almost as confiding as barnyard poultry. This is the case also with the smaller garden species. Next to freedom from disturbance by human inhabitants, protection from the domestic cat is necessary.

The supplying of food in winter is also important. Shrubs carrying fruit, suet hung in trees, and grain, broken nuts, and small fragments of dried meat sheltered from the snow, never fail to attract birds in the winter.

In summer, when natural supplies are plentiful, food seldom has to be supplied, though a row of fruiting sunflowers or the seed heads of many garden flowers well repay the trouble they may cost. A shallow pool of clean water is a never failing source of pleasure to nearly all the common garden birds. They both bathe in it and drink it and on a hot day it is no uncommon sight to see several birds awaiting their turn to enjoy the grateful coolness. The simplest form of bird bath is a shallow pan, set well out in the open and away from cover as a protection from cats. In cities where the trees are well cared for and dead wood is promptly removed, and on the treeless prairies, certain species of birds are always hard pressed to find suitable nesting sites. There are at least half a dozen species, naturally nesting in hollow limbs, that readily come to bird boxes of various kinds, and a number of other birds can be occasionally induced to do so. Suitable boxes are described in some of the books listed on page 17. In many schools where manual training is taught the boys are encouraged to build bird houses. Scope is thus given to their natural inventive genius, and at the same time they become interested in the birds that occupy the houses.

On the prairies nothing is more attractive to birds of many species than a tree plantation which not only serves to shelter the crops but brings birds to assist in combating insect plagues and please us with their song and beauty.

BIRD STUDY

The study of birds can be approached from a number of different angles. Far from the occasionally advanced idea that ornithology is a worked-out study, that we have learned all that is necessary to know about birds, there is still plenty of work to be done and in no branch of it have we even approached finality. The æsthetic bird lover, of course, can never exhaust his personal interest in the subject and is continually finding new beauties and personal appeals. To him, the first observation of even a trite and well-known fact comes with all the pleasure and force of a new discovery and there is little fear of the subject ever growing commonplace. To those who are ambitious of advancing the world's knowledge, ornithology offers many opportunities. Rarely will the complete life-history of even a single species fail to repay intensive work.

Our knowledge of bird distribution in Canada is still far from complete and there are vast areas in which it is based on assumption. Even such large and important political divisions as provinces are as a rule without recent authoritative lists of their birds. In many cases nothing but scantiest data for their compilation are available. It is only by the study of many local areas that such broader lists can be satisfactorily written, and in such local studies as these much good work can be done by the amateur. It must not be assumed that such local faunal work is easy; in fact, when conscientiously done it becomes one of the most difficult fields of ornithology. Ten years spent on such work assisted by all available literature and the advice of experts is little enough to form a satisfactory basis for work. Literature must be searched, weight of authorities estimated, evidence verified, specimens accurately identified, and all must be subject to the observer's experience and the probabilities. Knowledge of adjoining localities and general and local literature is indispensable for this. To satisfy modern standards of accuracy the making of a faunal list is one of the severest tests of ornithological ability.

The economic effect of bird life is an important study, and one in which the greatest caution is necessary. General impressions are so often misleading that conclusions should be founded only on irrefutable evidence. Stomach examination of what has actually been taken into the alimentary canal is practically the only positive evidence of food habits and in some cases leads to surprising results. No species should be condemned until a thorough study by this method has been made by experienced investigators. Such a study is beyond the amateur, but he can assist greatly by preserving the stomachs of those specimens he collects in the course of his work and forwarding them to the Victoria Memorial Museum where they may be either immediately examined or stored for reference later. Field observations of the economic status of species when accurately observed and reported are often of great value, but must be used with the greatest caution.

Of late years "banding" has become an established and valuable method of bird study. Numbered aluminum bands with return address are locked about the legs of nestlings and trapped birds in such a manner as not to interfere with their normal activities, and the bearers are released. Full records are kept of species, date, locality, age, and circumstance in each case. Returns from these banded specimens are coming in now in considerable numbers and we are getting exact, demonstrable knowledge of them, where hitherto we had nothing but guesswork or analogy to go upon. The practice of systematically banding on a limited home area throughout the season, and year after year, has been particularly fruitful and has opened up an entirely new field of interesting research to the amateur observer of limited opportunity. Such work, of course, has to be regulated to prevent unqualified persons from participating and the confusion of duplicate records, bands, and systems. In Canada, such work is under the control and supervision of the National Parks Branch of the Department of the Interior, who issue the necessary permits to anyone wishing to engage in this form of research in Canada.

A serious word should be said on the much discussed question of the collection of specimens as a method of bird study. Various persons take various interests in bird study. Some are satisfied just to see or hear birds about them, and take little interest in what they are, what they do, or what they are named. This is, of course, a perfectly legitimate limitation, but there are other interests without which advancement in knowledge or appreciation is impossible. At the other extreme are those who are unsatisfied until they know all about the objects of their admiration and interest, and have pried into the innermost secrets of their relationships, habits, and economy. Between these extremes are every degree and combination of æsthetic and scientific interest. It may not be necessary for all to become highly developed scientific ornithologists, but it is essential to every art or science that there exist a certain leaven of experts to direct the amateur, assist him with short-cuts, and present conclusions that he may not be qualified or inclined to discover for himself. Equally necessary is it to healthful development of any such line of inquiry that there be these experts and specialists to set, by example, standards of excellence and method. This is as true in ornithology as it is in art, athletics, or stock raising. Considerable æsthetic pleasure and some information can be obtained by merely watching birds in life, more can be obtained by use of field glasses and systematic study, but it is no more possible for one to obtain accurate and comprehensive knowledge of birds than of plants or insects without collecting or at least handling specimens. It would be impossible for anyone to write such a book as this without constant access to complete or extensive series of specimens. Scientific ornithologists are necessary, but they cannot be developed without conceding them the right to collect and study at first hand the material through which they can develop. That such a right cannot be distributed too freely is obvious. In consequence, for collecting in Canada for scientific purposes, birds covered by the Migratory Birds Convention Act, a permit from the Canadian National Parks Branch of the Department of Interior is necessary. These are granted to applicants who show that they are sincere and bona fide bird students, qualified to make proper use of them. The spirit in which these permits are issued and the guards against their abuse are well shown by the following "principles" that are attached to and form a part of them.

PERMIT PRINCIPLES

Permits to take migratory birds, their nests and eggs, under the Migratory Birds Convention Act and Regulations, are granted for the sole purpose of scientific study and not for the collection of objects of curiosity or personal or household adornment. Therefore, only such persons as take a serious interest in ornithology, and are competent to exercise the privilege for the advancement of knowledge, are eligible to receive such permits.

It is expected that the holders of permits will use them with reasonable discretion, taking only such specimens as their scientific requirements demand and avoiding unnecessary waste of life. The habitual taking of numbers of individuals for the purpose of obtaining a few specially desirable ones is deprecated and it is urged that the collector take no more specimens than he has reasonable prospects of caring for and will conscientiously endeavour properly to prepare each and all when taken.

It is also recommended that the holders of permits will, so far as is consistent with their object, be considerate of the local feeling in the neighbourhood where they collect and will demonstrate both by actions and speech that the scientific collector is sympathetic towards the principles of wild-life conservation and is not the rival of legitimate sportsmen.

It is required as an evidence of good faith that holders of permits label their specimens with the customary scientific data and properly care for them, not only at the time of collection but thereafter, giving them all reasonable protection against insect pests and other agencies of destruction, and will not permit them to be destroyed through carelessness or indifference.

As permits are granted for the purpose of general scientific advancement and not for individual benefit, specimens taken under them are to be regarded as being in the nature of public trusts, and should be accessible to all duly qualified students under only such reasonable restrictions as are necessary for their protection or as are consistent with the owner's work.

Finally it is urged that provision be made so that specimens taken will ultimately find their way into permanent or public collections where they will be available for study by future generations and not be wasted and lost through neglect.

Although all these conditions are not strictly mandatory, and their spirit will be liberally interpreted, they will be considered in the granting or renewal of each permit, and evidence of gross violation of them may be deemed sufficient ground for the refusal of an application or for the revocation of any permit already granted.

It is hoped and expected that the justice of these principles will be realized and that collectors will co-operate in advancing science to the utmost without unnecessary waste of valuable bird life."

In concluding this subject of bird study attention is called to the fact that the various departments of the Government stand ready to assist the earnest student in every possible way. Their greatest usefulness will usually be found in the identification of specimens. The Victoria Memorial Museum, Ottawa, will gladly identify and return any specimens that may be submitted for that purpose. Sometimes a fragment, such as a wing or tail, sometimes even a feather or two, will suffice. Of course, complete, well-made skins of the whole specimen are best, but the reader is urged, when these are not available, to preserve as many as possible of the easily prepared parts of birds he may be in doubt of and submit them to the Museum for examination. The Canadian National Parks Branch of the Department of the Interior, Ottawa, being in charge of the administration of the Migratory Birds Convention Act, is particularly interested in all questions of protection and public education and the services of its officers in allied subjects are equally at the disposal of inquirers. Earnest students are also always welcomed by the more advanced ornithologists, who are ready to assist them and give advice most freely.

ORNITHOLOGICAL LITERATURE

The ornithological literature of eastern North America is rich and varied; that of the western parts is slightly less so. However, there are extant a number of works concerning the birds of various provinces or localities, or those of adjoining areas, which may be consulted with advantage for details of various species other than those here given. The following manuals are recommended:

Bird Guides—Western Bird Guide, Birds of the Rockies and West to the Pacific. Water and Game Birds East of the Rockies (Including Hawks and Owls). Land Birds East of the Rockies. By Chester A. Reed. Doubleday, Page, and Co., Garden City, N.Y. Price each $1 in cloth, $1.25 in leather.

These are small, almost vest-pocket editions in limp bindings, 3¼ by 5½ inches, very convenient for carrying in the pocket. They contain small, easily recognized, coloured illustrations of all the birds in both sexes, and brief descriptions. Considering their size, convenience, and price they are very excellent.

Colour Key, North American Birds, by Frank M. Chapman and Chester K. Reed; 8vo., Doubleday, Page, and Co., Garden City, N.Y.

Similar in plan to above, but more detailed and instructive.

Handbook of the Birds of Eastern North America, by Frank M. Chapman; 12mo. D. Appleton & Co., New York.

This is an almost complete text book of the birds of eastern North America and applies equally well to the Prairie Provinces, especially the eastern parts, though a number of birds occur there that are not treated in the work. It is invaluable to the advanced student of these sections as well as to the beginner. It contains accurate details of all plumages, measurements, and migration dates, and an immense amount of interesting and valuable information, together with a most instructive introduction to birds and bird study.

Handbook of Birds of the Western United States, by Florence Merriam Bailey; 8vo. Revised edition, 1920, Houghton, Mifflin, & Co., Boston.

This does for the western United States nearly what the previous book does for the east, and is of special value for use in British Columbia. However, its field being limited to the United States, there are a few Canadian species with which it does not deal. In spite of this it is invaluable to the far-western observer.

Key to the Birds of North America, by Elliot Coues; 5th edition, 1903, 2 vols., large 8vo., Dana Estes & Co.

This is perhaps the most generally accepted authority on American birds. It is primarily intended for the advanced student, but it contains a mass of information that can be found nowhere else and is a final court of appeal to the majority of ornithologists.

Unfortunately it is now out of print and can be obtained only occasionally through second-hand book dealers.[1]

Birds of the Northwest, by Elliot Coues, Department of the Interior, United States Geological Survey of the Territories. Miscellaneous Publication No. 3, Washington. Government Printing Office, 1874.

This is a handbook of the ornithology of the region drained by Missouri river and its tributaries. It contains an immense amount of technical and popular information regarding a great number of birds of interest to the Canadian observer. It is notable as much for its literary style as for its scientific accuracy. Unfortunately it also is out of print.

Birds of the Colorado Valley, Part I, Passeres to Laniidæ (all that was ever published), by Elliot Coues, Department of the Interior, United States Geological Survey of the Territories. Miscellaneous Publication No. 11, 1878.

This is similar and supplementary to the above. In addition it contains an important Bibliography to American Ornithology. It, too, is out of print.

Birds of North and Middle America, by Robt. Ridgway: Bulletin No. 50, 8vo., United States National Museum.

This is a monumental work planned in ten volumes, of which eight are in print, the remainder to follow as rapidly as the work can be prepared. It is the latest and the most detailed and scientific work on the subject, but it contains nothing on life histories or allied popular subjects. It is not for general sale but may be procured from second-hand book dealers or through the Department of Public Documents at Washington.

Catalogue of Canadian Birds, by John and James M. Macoun; 8vo., published by the Department of Mines, Geological Survey Branch, Ottawa, 1909.

This is a complete list of all the species and subspecies of birds known to occur in Canada, Greenland, and Newfoundland, with their ranges both breeding and migratory as thoroughly stated as the condition of knowledge at the time of publication permitted. It is based largely upon the explorations and experience of the authors, supplemented by knowledge from all available sources, and contains considerable information regarding breeding habits but little else of popular interest. It is now out of print.

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[1] Books that are out of print are usually difficult to obtain. Fortunately there are a number of dealers who specialize in various second-hand books. Many of these dealers issue periodical catalogues of volumes they have for sale, and any of them when given particulars of books desired will make every effort to fill the order.

Books Dealing with Special Groups of Birds

The Warblers of North America, by Frank M. Chapman; D. Appleton & Company.

North American Land Birds, by Baird, Brewer, and Ridgway; Little, Brown, & Co., 3 vols. Reprint of the original.

The Water-birds of the series was originally published in Memoirs of the Museum of Comparative Zoology, Harvard College, 1884, but is now out of print and very difficult to obtain.

The Game Birds of California, by Grinnell, Bryant, and Storer; University of California Press, Berkeley, California, 1918.

A work of great value to the sportsman and the conservationist. Almost as applicable to Canada as to California.

Life Histories of North American Birds, by A. C. Bent, United States National Museum, Washington. Diving Birds, Bulletin 107, 1919. Gulls and Terns, Bulletin 113, 1921. Petrels, Pelicans, and their Allies, Bulletin 121, 1922. Wild Fowl, Ducks, Part I to Ringneck, Bulletin 126.

Others to follow as rapidly as possible. This is a monumental work in which, as far as possible, all sources of information have been exhausted in the treatment of life history and plumage sequences of North American birds. It is a continuation of—

Life Histories of North American Birds, by Major Chas. Bendire, United States National Museum. Vol. I, Gallinaceous Birds, the Pigeons and Birds of Prey, Special Bulletin No. 1, 1892. Vol. II, Parrots to the Grackles, Special Bulletin (unnumbered) 1895.

Unfortunately these are both out of print and very rare.

Books of Special Geographical Interest

The Birds of Manitoba, by Ernest Thompson Seton. Proceedings U.S. National Museum, XIII, 1890, pp. 457-641.

A complete annotated list of the birds of Manitoba as known at that time, with much valuable information as to occurrence, distribution, and life-history notes.

Fauna of Manitoba, Birds, by Ernest Thompson Seton, British Association Handbook, 1909.

This is a summarized reprint of the above brought up to date of publication.

Catalogue of the Birds of Saskatchewan, by H. Hedley Mitchell. The Canadian Field Naturalist, XXXVIII, Special Number, 1924, pp. 101-118. Separates also obtainable from the Department of Agriculture, Regina, Sask. This is a list with distributions of all birds known to occur in the province.

A Biological Investigation of the Hudson Bay Region, by Edward A. Preble, U.S. Department of Agriculture, Bureau of Biological Survey, North American Fauna No. 22, 1902. Of particular application to northern Manitoba.

A Biological Investigation of the Athabaska-Mackenzie Region, by Edward A. Preble, United States Department of Agriculture, Bureau of Biological Survey, North American Fauna No. 27, Washington, 1909.

The bird section of this work, pp. 251-500, is of particular value, summarizing as it does all the information available on the Northwest Territories and the western Arctic islands. It deals mostly with the distribution of species.

Guide to Natural History and Ethnological Exhibitions in the Provincial Museum of British Columbia, Victoria, B.C., 1909.

The list of birds, pp. 21-71, is in effect a catalogue of the birds of the province developed from the Check-list of British Columbia Birds by John Fannin, published by the Museum, 1898. It is merely distributional.

Report on a Collection of Birds and Mammals from Vancouver Island, by Harry S. Swarth, University of California, Publications in Zoology, vol. 10, No. 1, 1912. Birds, pp. 13-113.

This should form the basic list for future development of check-lists of the birds of Vancouver island and contains critical studies of species and subspecies as well as their distribution.

Birds and Mammals of the Stikine River Region of Northern British Columbia and Southeastern Alaska, by Harry S. Swarth, University of California, Publication in Zoology, vol. 24, No. 2, 1922. Birds, pp. 194-308.

Birds and Mammals of the Skeena River Region of Northern British Columbia, by Harry S. Swarth, University of California, Publications in Zoology, vol. 24, No. 3, 1924. Birds, pp. 323-372.

Natural History of the Queen Charlotte Islands, by Wilfred Osgood, U.S. Department of Agriculture, Bureau of Biological Survey, North American Fauna, No. 21, 1901. Birds, pp. 38-50.

Biological Investigations in Alaska and Yukon Territory, by Wilfred H. Osgood, U.S. Department of Agriculture, Bureau of Biological Survey, North American Fauna No. 30, 1909.

Results of a Biological Reconnaissance of the Yukon River Region, by Wilfred H. Osgood and Louis B. Bishop, U.S. Department of Agriculture, Bureau of Biological Survey, North American Fauna, No. 19, 1900.

Birds Collected or Observed on the Expedition of the Alpine Club of Canada to Jasper Park, Yellow-head Pass, and Mount Robson Region, by J. H. Riley, The Canadian Alpine Journal, pp. 47-75, 1912.

Addenda to Birds of Jasper Park, by P. A. Taverner, The Canadian Alpine Journal, 1918, pp. 62-69.

A Distribution List of the Birds of British Columbia, by Allan Brooks and Harry S. Swarth, Cooper Ornithological Club, Pacific Coast Avifauna No. 17, being Contribution No. 423 from the Museum of Vertebrate Zoology of the University of California, 1925. This is a list of all the species and subspecies of birds known to occur in British Columbia, with full detailed distributions.

Besides these works on particular Canadian areas there are numbers on adjoining localities of special interest to nearby Canadian observers. Among them are:

A Preliminary Survey of the Bird Life of North Dakota, by Norman A. Wood, University of Michigan, Museum of Zoology, Miscellaneous Publications No. 10, Ann Arbor, Michigan, 1923.

A Distributional List of the Birds of Montana, by Aretas A. Saunders, Cooper Ornithological Club, Pacific Coast Avifauna No. 14, Berkeley, California, 1921.

The Birds of Washington, by Wm. Leon Dawson, British Columbia Edition with Supplementary matter by Allan Brooks. The Occidental Publishing Company, Seattle, Washington, 1909.

This contains a large number of coloured and uncoloured illustrations and much life-history, in a very entertaining form.

Ornithology, like other branches of science, has its own periodicals. The chief of these in North America is the "Auk," a quarterly magazine, the official organ of the American Ornithologists' Union. In addition to purely scientific papers, it contains hundreds of articles of interest to Canadians, including local lists copiously annotated with life-history notes from all over the Dominion and descriptions of habits popularly discussed. Subscription $3 a year. Editor, beginning 1912, Witmer Stone, Academy of Science, Philadelphia, Pa.

The "Condor," a bi-monthly magazine of Western Ornithology, the official organ of the Cooper Ornithological Club. Edited by Joseph Grinnell, Berkeley, California. Subscription in Canada $3.25 a year. Address W. Lee Chambers, Business Manager, Eagle Rock, California. This is a well edited and beautifully illustrated periodical devoted to the study of western birds and contains much of popular as well as scientific interest.

"Bird-lore" is a popular, monthly magazine notable for its beautiful make-up and illustrations. It is the official organ of the National Audubon Societies and is devoted to the popular study and protection of birds; it is edited by Frank Chapman. Subscription in Canada $1.75 a year. Address, Bird-lore, Crescent and Mulberry streets, Harrisburg, Pa.

The "Canadian Field Naturalist," the continuation of the "Ottawa Naturalist," is a monthly (nine numbers a year) published by the Ottawa Field Naturalists' Club. Subscription $1.50 a year. Address B. A. Fauvel, 321 McLeod St., Ottawa, Ont. This publication represents numerous Natural History Societies of the Dominion. It contains a great deal of interesting zoological material and numerous ornithological notes and articles, and is the only Natural History magazine published in Canada.

On the subject of protection and attraction of birds about the home, among the great mass of literature available, the following can be specially recommended:

How to Attract and Protect Wild Birds, by Martin Hiesmann: Witherby & Co., London, 1s. 6d.

This is an extended account of the methods pursued by Baron von Berlepsch in Germany, and gives numerous methods by which the end can be obtained on both large and small estates.

Wild Bird Guests, by Harold Baynes: E. P. Dutton & Co., New York, 1915, $2.

This gives a most interesting and readable account of the method pursued by the writer and his friends whereby they made Meriden, New Hampshire, a veritable model bird village, where the birds became as familiar and friendly as household pets, coming when called and alighting freely upon the person. It is beautifully illustrated with numerous photographs showing both methods and results.

The Domestic Cat, by Edward H. Forbush, State Ornithologist, Mass. State Board of Agriculture, Bulletin No. 2, 1916.

This is an exhaustive treatment of the house cat in its relation to wild-bird life.

Bird Houses and How to Build Them, by Ned Dearborn: United States Department of Agriculture, Farmer's Bulletin No. 609. Address, Department of Public Documents, Washington, D.C. Cost about ten cents.

Bird Houses and Their Occupants, by P. A. Taverner, reprinted from The Canadian Field Naturalist, vol. XXXII, 1919, pp. 118-126, by the Canadian National Parks Branch, Department of the Interior, Ottawa, from whom copies may be obtained.

Attracting Birds with Food and Water, by R. Owen Merriman, Canadian National Parks Branch, Department of the Interior, Ottawa.

The Conservation of Wild Life of Canada, by C. Gordon Hewitt, Chas. Scribner's Sons, New York, 1921.

Jack Miner and the Birds, by Jack Miner, Ryerson Press, Toronto, 1923.

Many publications, pamphlets, and reports on these and other subjects are published by various federal, provincial, and state governments and may be obtained either free of cost or at a nominal price. The Victoria Memorial Museum, Ottawa, and the Canadian National Parks Branch, Department of the Interior, Ottawa, issue numerous such brochures which can be obtained on application. The United States Department of Agriculture has published a great number of scientific, economic, and popular reports which can be obtained at a nominal price. Many of them apply directly to Canadian conditions. A catalogue and price list of them can be obtained from the Department of Public Documents, Washington, D.C.

On the subject of the English Sparrow as a pest the following can be recommended:

The English Sparrow in North America, by Walter B. Barrows: Bull. No. 1, U.S. Dept. of Agriculture, 1889, pp. 405.

How to Destroy the English Sparrow, by Ned Dearborn: Farmer's Bulletin No. 383, U.S. Dept. of Agriculture, 1910.

The English Sparrow as a Pest, by Ned Dearborn: Farmer's Bulletin No. 493, U.S. Dept. of Agriculture, 1912.

These reports give the English Sparrow a fair trial and an honest conviction, and suggest various means of keeping its number under control.

The method of its use is as follows. Given a bird in the hand of unknown species to determine its name, it is first compared with the first heading in **boldface** numbered in Roman numerals—**I, Feet Fully Webbed.** If this description does not fit the bird, the next Roman numeral heading is referred to—**II, Feet Partly Webbed,** or **III, Feet Without Pronounced Web.** Assuming that the last correctly describes the bird under discussion, we refer to the headings of next lower rank, which are numbered alphabetically with capital letters, where we find the alternatives—"F Legs long," and "G, Legs short." Sometimes it may be difficult to decide whether a leg should be regarded as long or short, and the various pictured details following may then assist determination. In this case the legs, we decide, are not remarkably long, no longer in proportion to size of the bird than are the legs of a chicken or sparrow; we, therefore, under G, refer to a number of subordinate alternatives, distinguished by small initial letters—"l, feet chicken-like, strong and compact for scratching"; "m, feet strongly clawed for holding prey"; "n, feet small and weak"; "o, feet small or medium-sized, solidly made, and legs covered with horny scales or plates." Glances at various feet shown under each heading will assist in determination. Assuming a decision in favour of the last, we compare our specimen with the next alternatives, numbered with ordinary Arabic numerals—"20, two toes in front"; "21, three toes in front." There can be little confusion here and we assume that our specimen having three front toes is one of the great body of perching birds. We, therefore, compare it with the following line detail drawings to see with which it agrees most closely. The bill is not wide and flat, it is, therefore, not a Flycatcher; there are no ear-tufts or long hind toe and the nostril is not covered with feather tufts, therefore it cannot be either a Horned Lark, a Crow, or a Jay. The next picture, the Bobolink's bill, catches our eye and the Sparrow bill in the next lot. A glance through the remainder shows that our bird must be a Bobolink or one of the Sparrows. The picture, page 264, and description of the former, is nothing like it; therefore, we turn to the Sparrows, read the general Sparrow description, and remarks on page 272, and then work through the pictures. After looking at all the illustrations we find that our specimen agrees with that of the Song Sparrow, and on reading over the distinctive characters we have our opinion confirmed. It has the sharply striped breast aggregated in the centre, and is without either the yellow stripe over the eye of the Savannah Sparrow or the white outer feathers of the tail, as in the Vesper. We are, therefore, confident that, starting with no other ornithological knowledge than that the specimen was a Canadian bird, we have been able to refer it to its proper species.

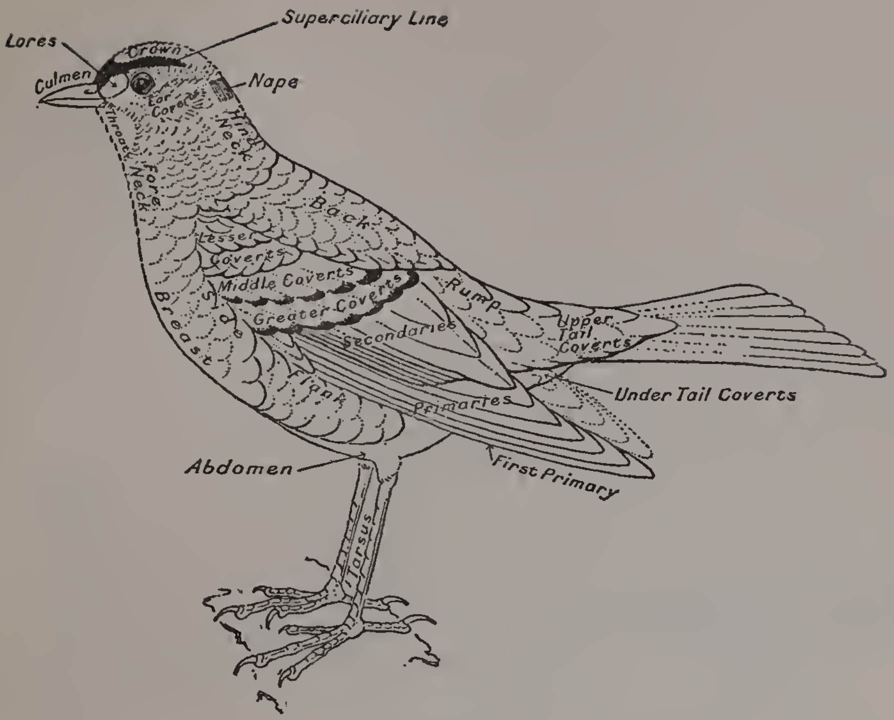


Figure 1

Plumage areas of a typical bird.

I. Feet Fully Webbed—Two or three complete webs to each foot

A, Toes, four.
  a, Tarsus flattened.

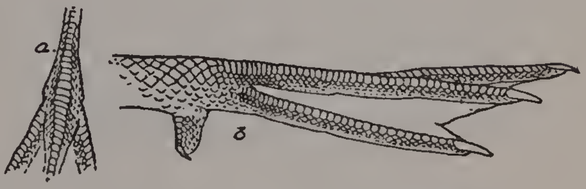


Figure 2

Loons.. p. 39

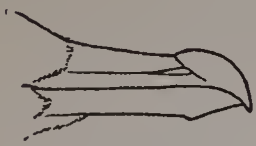


Figure 3

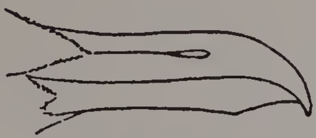


Figure 4

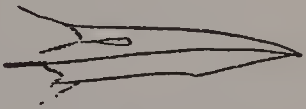


Figure 5

b, Closed wing longer than tail, except in some Jaegers (Figure 3) and Terns (Figure 5), in which the rule only holds if the greatly elongated central tail feathers of the former or the outer ones of the latter are disregarded. Bills are shown.

Long-winged Swimmers—Gulls, Terns, Jaegers.................. p. 48

c, Webs between all toes (3 webs)

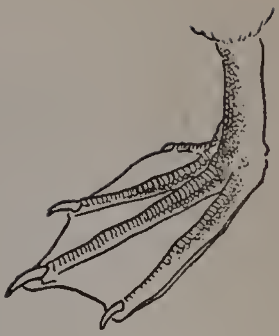


Figure 6

Full-Webbed Swimmers—Gannets, Cormorants, etc.,............ p. 70

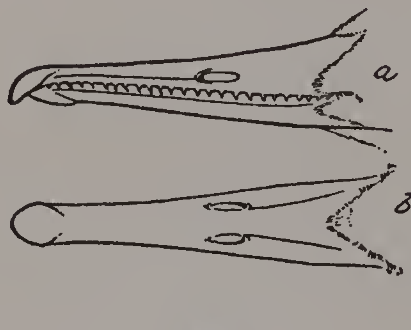


Figure 7

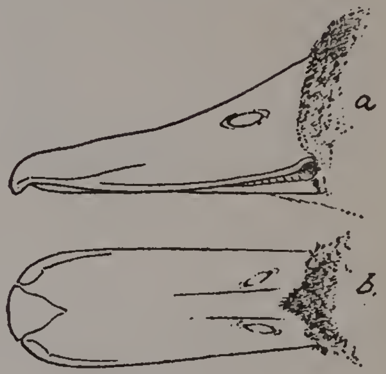


Figure 8

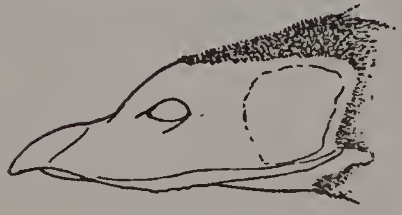


Figure 9

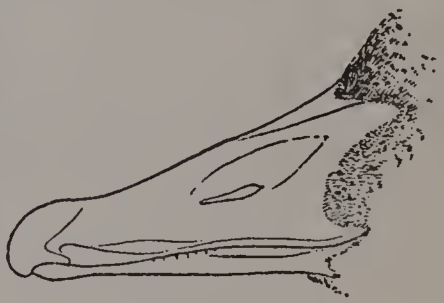
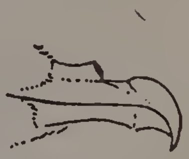


Figure 10

d, Bill toothed or flattened (Duck-like).

Sieve-billed Swimmers—Mergansers, Ducks, Geese, and Swans.. p. 75



e, Nostrils in tubes on top of bill.

Figure 11

Tube-nosed Swimmers—Petrels, etc............................ p. 65

B, Toes three (without hind toe), except Kittiwake (p. 53).

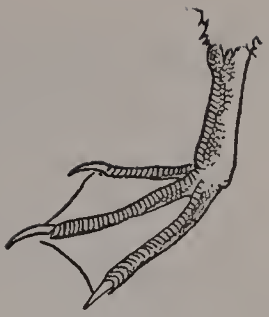


Figure 12

Auks, Murres, etc. . . . . p. 43

II. Feet Partly Webbed—Webs reduced to scallops, bordering flaps or small webs at base of toes. Toes four, except as otherwise noted

C, Tarsus much flattened; webs as shown.

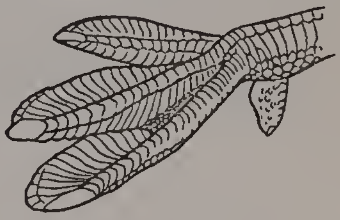


Figure 13

Grebes . . . . p. 36

D, Bill extending on forehead and forming frontal plate.

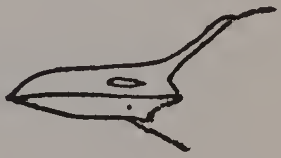


Figure 14

Coot . . . . p. 127

E, Small birds; bill long and slender, in some cases decurved or recurved; toes three or four.

f, Bill without hard terminal enlargement; toes four, except Sanderling (p. 141).

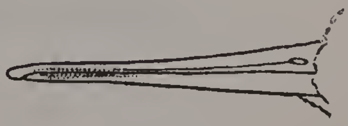


Figure 15

Shore Birds—Phalaropes, Snipe, Sandpipers, Plover . . . . p. 127

g, Bill with hard terminal enlargement; toes three, except Black-bellied Plover (p. 151).

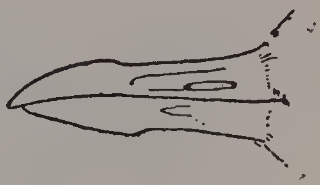


Figure 16

Plover . . . . p. 151

h, Bill long and straight, much flattened to a strikingly chisel-shaped tip, and bright red in colour.

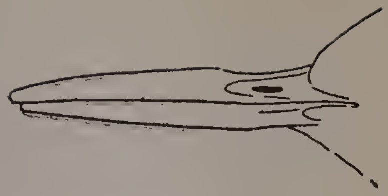


Figure 17

Oyster-catcher .... p. 157

III. Feet Without Pronounced Web

F, Legs long, for wading in water or mud; toes long, slender, and flexible at joints.

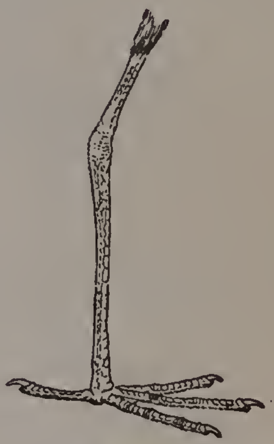


Figure 18

i, Bill stout and horny; bare space about eyes.

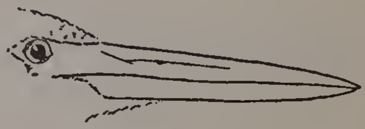


Figure 19

1, Middle toe with comb.

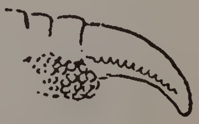


Figure 20

Herons.. p. 114

2, Forehead bare, bill straight.

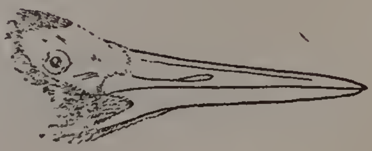
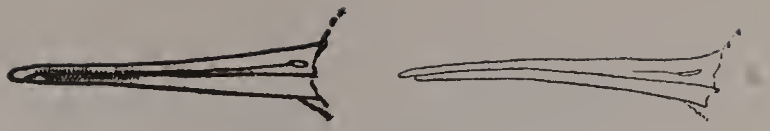


Figure 21

Cranes.. p. 120

j, Bills long, flexible, and evenly tapered.



Figures 22 and 23

3, Bill rather slender, not markedly deeper at base than tip, in some cases markedly decurved or recurved. Toes four, except Sanderling (p. 141).

Phalaropes, Snipe, Sandpipers .... p. 127

4, Bill rather decidedly heavier at base than at tip.

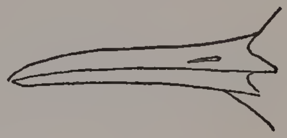


Figure 24

Rails (Virginia Rail).. p. 125

k, Bills short.

5, Bill soft at base ending in hard terminal enlargement. Toes three, except Black-bellied Plover (p. 151).

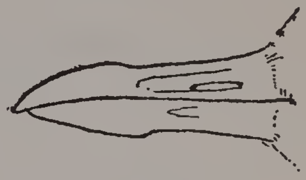


Figure 25

Plover.. p. 151

6, Bill quite stout.

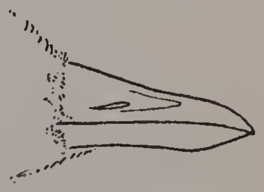


Figure 26

Rails (Sora and Yellow Rails).................................... p. 126

7, Bill horny to base, wedge-shaped in profile, and appearing to be slightly turned up.

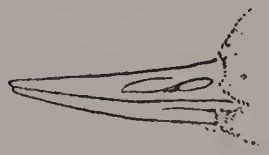


Figure 27

Turnstone.. p. 156

G, Legs short for perching, walking, climbing, and living in trees or on land.

1, Feet chicken-like, strong and compact; toes less flexible; claws strong and blunt for scratching. Tarsus feathered or bare. With or without comb like appendages on toes.

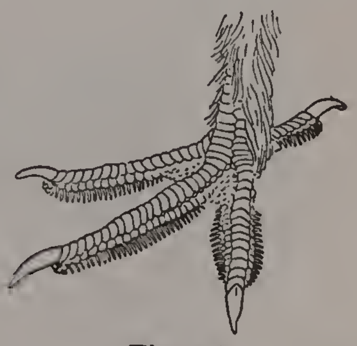


Figure 28

8, Bill rather conical; feathered to or about nostril.

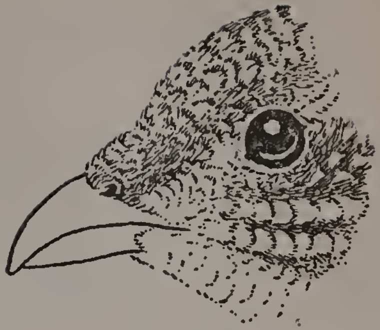


Figure 29

Grouse and Quail.. p. 158

9, Bill hooked; neck and head bare.

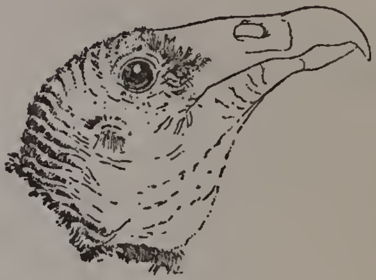
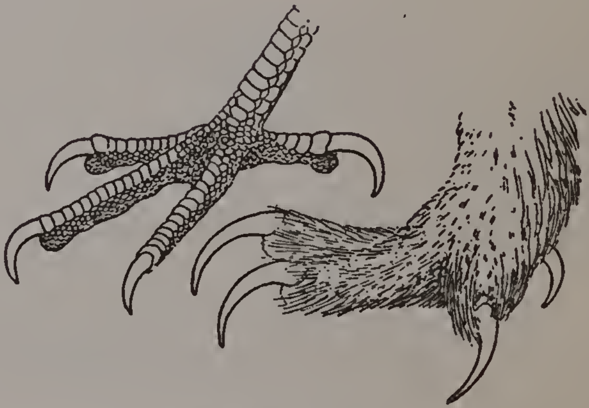


Figure 30

Vultures.. p. 180

m, Feet powerful for holding prey; claws long, strong, sharp, and curved, tarsus feathered or bare.



Figures 31 and 32

Birds of Prey... p. 178

10, Naked cere at base of bill. Tarsus always (except Roughleg Hawk and Golden Eagle) bare. Toes always bare (Figure 31).

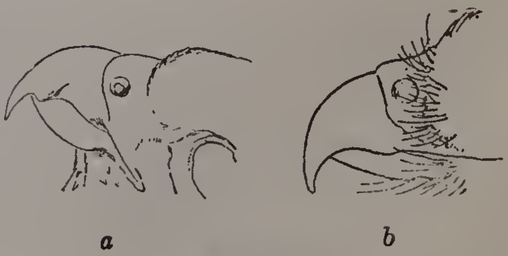


Figure 33

Hawks and Eagles.. p. 184

11, Cere hidden in feathers; eye in centre of more or less circular feather disks. Tarsus and toes feathered (Figure 32).

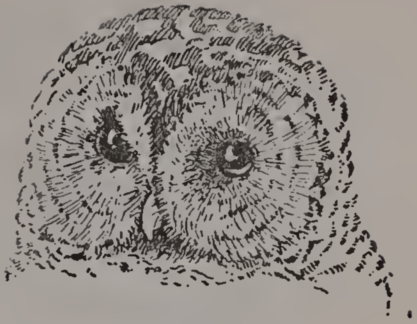


Figure 34

Owls.. p. 212

n, Feet small and weak.

12, Nostrils opening in a soft and somewhat swollen base.

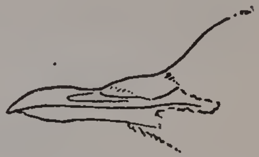


Figure 35

Pigeons.. p. 174

13, Two outer toes joined together for half their length.

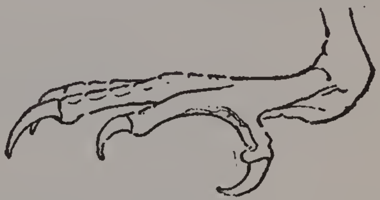


Figure 36

Kingfishers.. p. 224

14, Two toes directed forward, two backward (*See also* Woodpeckers).

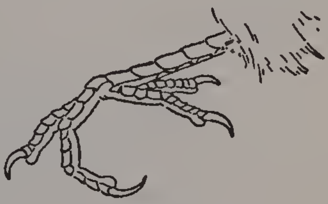


Figure 37

Cuckoos.. p. 222

15, Bill very small; mouth enormous, opening to below eyes.

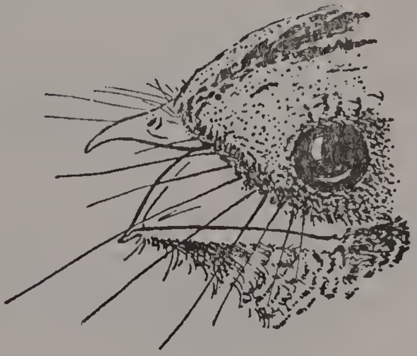


Figure 38

Goatsuckers.. p. 235

16, Uniformly sooty coloration, tail feathers not ending in spines.

Black Swift.. p. 239

17, Feet and toes partly feathered.

White-throated Swift.. p. 241

18, Tail feathers ending in sharp spines.

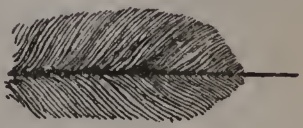


Figure 39

Chimney Swift or Vaux Swift................................ p. 240

19, Bill very slender and awl-shaped. Exceedingly minute birds.

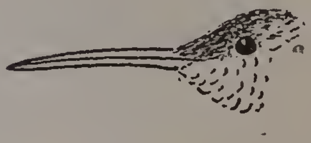


Figure 40

Hummingbirds... p. 241

o, Feet, medium-sized or small, but not noticeably weak, flabby, or loose jointed. Legs covered with scales or plates.

20, Two toes in front, either one or two directed backwards. Bill chisel-shaped at tip.

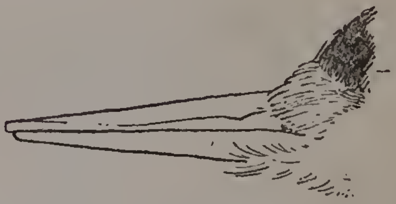


Figure 41

Woodpeckers... p. 225

21, Three toes in front; hind toe as well developed and as long as middle toe; claw on hind toe usually as long as, or longer than, that on middle toe.

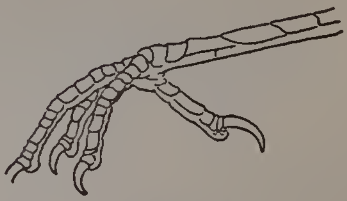
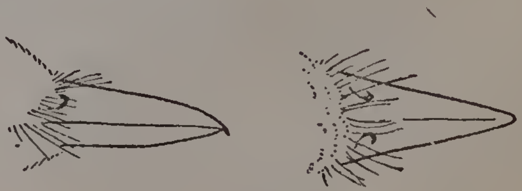


Figure 42

Perchers... p. 244

Recognition Details of the Perchers

Bill wider than high at base; tip slightly hooked.



a Figure 43 b

Flycatchers... p. 245

Note ear tufts and long hind toenail. Longspur and Pipit only other species having latter feature.

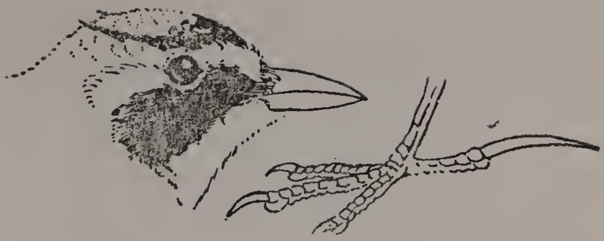


Figure 44

Horned Lark.. p. 253

Bill stout, nostrils covered by bristly tufts.

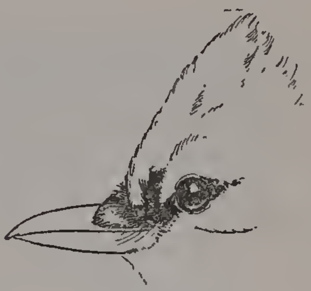
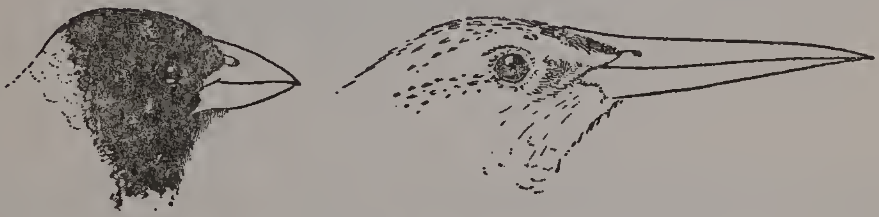


Figure 45

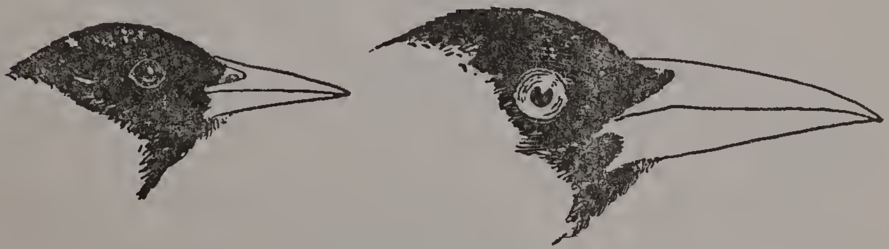
Crows, Jays, etc.. p. 255

Keel of bill usually extending more or less up on forehead.



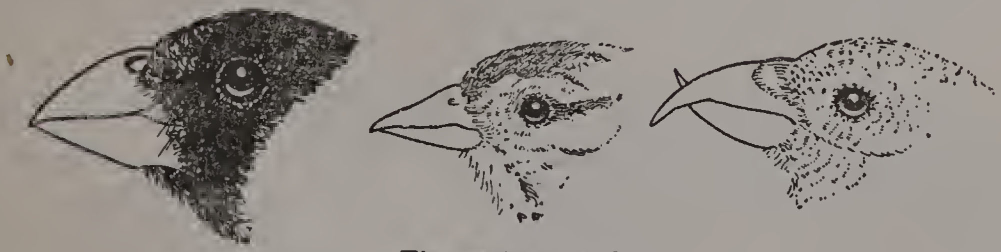
Figures 46 and 47

Cowbird and Bobolink (Figure 46) have bills resembling the sparrows. See species.



Figures 48 and 49

Starlings.. p. 262



Figures 50, 51, and 52

Bill conical, stout for seed cracking. (Bills of Bobolink and Cowbird superficially similar, *See* descriptions.)

Sparrows.. p. 272

Slight or marked tooth on cutting side of upper mandible.

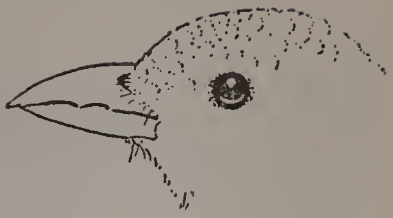


Figure 53

Tanagers.. p. 301

Bill very small, wide, and flattened at base.

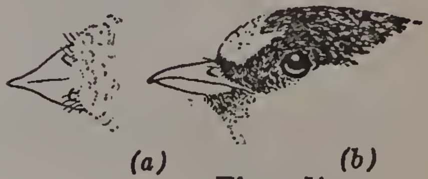


Figure 54

Swallows... p. 302

Crest and black eye-band most conspicuous.

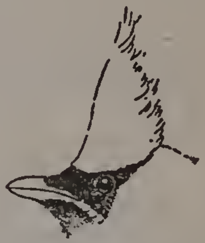


Figure 55

Waxwings.. p. 307

Tooth near tip of upper mandible.

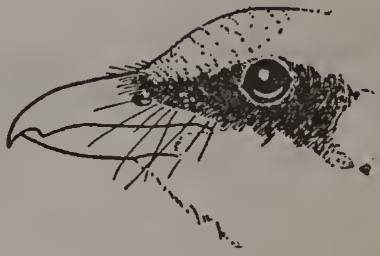
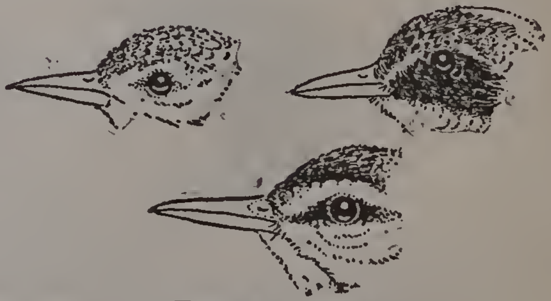


Figure 56

Vireos and Shrikes.................................. pp. 309, 311

Small, brightly coloured birds. Olive-greens, yellows, and black are perhaps the commonest colours, but blues, reds, and other colours are often present.



Figures 57, 58, 59

Wood Warblers.. p. 313

Fine, sharp bill and long claw on hind toe.

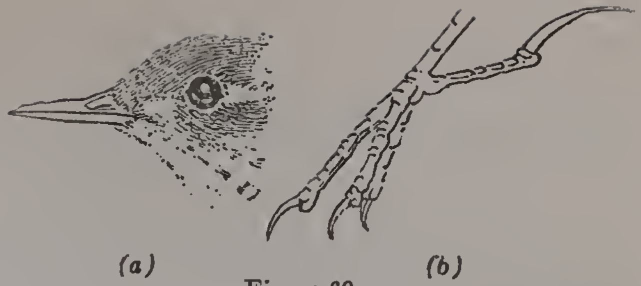
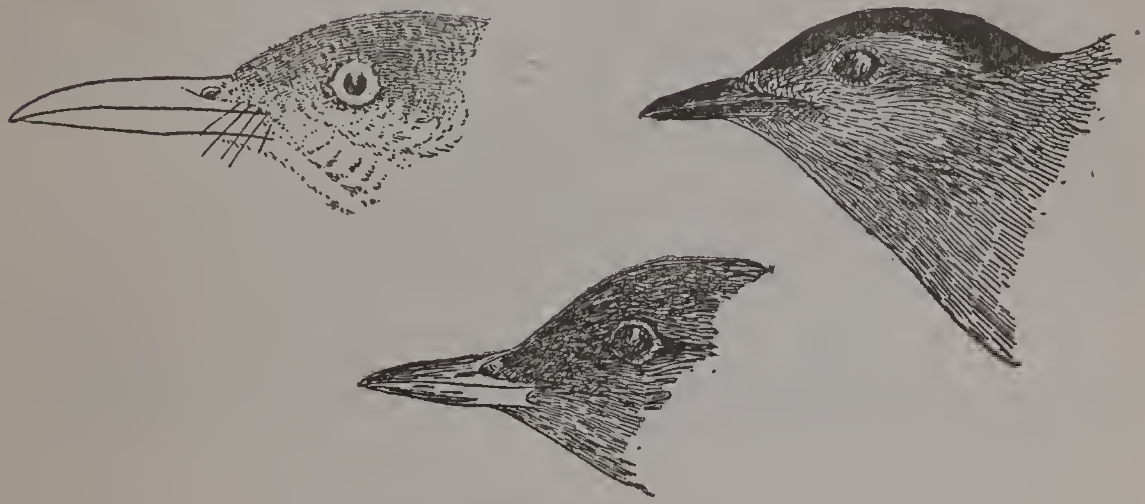


Figure 60

Pipit .... p. 330



Figures 61, 62, 63

Large and medium-sized birds. Bills as shown. Thrasher, large red-brown and white bird; Catbird, even slate grey with black cap; Dipper, uniformly grey with short tail.

Thrasher, Catbird, or Dipper .... p. 332

Small birds coloured in shades of wood-brown.

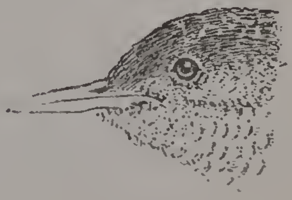


Figure 64

Wrens .... p. 334

Small birds in wood-brown colours. Tail long and stiff, feathers pointed at end.

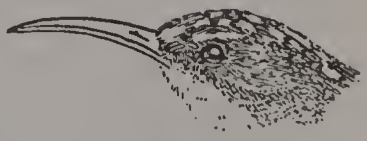


Figure 65

Creepers .... p. 339

Bill pointing slightly upwards.

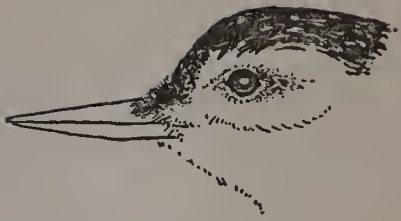


Figure 66

Nuthatches.. p. 340

Very small birds, dark cap and throat and pronounced white face area.

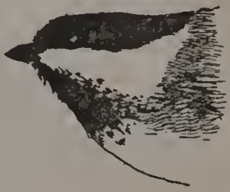


Figure 67

Titmice.. p. 342

Very small birds, olive-coloured. Males with small, brightly-coloured crown patch.

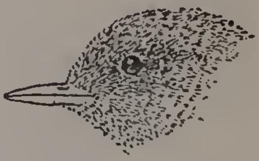


Figure 68

Kinglets.,... p. 344

A medium-sized bird, uniform soft grey with white eye-ring, a long tail, and no black cap.

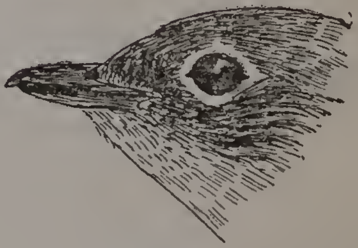


Figure 69

Townsend's Solitaire... p. 346

Medium-sized birds, coloured usually, except Robin and Blue-birds, in soft browns with more or less spotted breast.

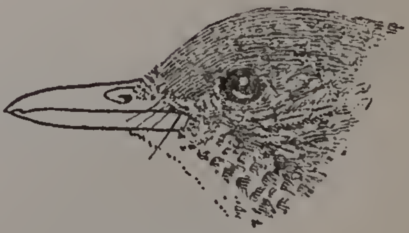


Figure 70

Thrushes... p. 347

DESCRIPTIVE ORNITHOLOGY

CLASS—AVES. BIRDS

Birds, as a class, may be divided into toothed and toothless birds, although the former are now extinct and are known only by their fragmentary remains preserved as fossils. All modern birds are toothless. Some species, for example the Mergansers, are furnished with serrations in the horny bill that have a superficial resemblance to teeth (Figure 7, page 24), but examination shows that they are not true teeth.

SUBCLASS—CARINATAE. KEEL-BREASTED BIRDS

Present day, toothless birds are divided into two subclasses, *Ratitae* or raft-breasted birds and *Carinatae* or keel-breasted birds. The *Ratitae* include the Ostriches and Emus which are without a keel to the breast bone for the attachment of wing muscles and are flightless. There is none in North America and they are, therefore, not dealt with here. The term keel-breasted is derived from the high, thin, keel-like projection from the middle of the breast bone, to which the powerful breast or wing muscles are attached.

Keel-breasted birds (subclass *Carinatae*) are divided into numerous orders which are considered here in the sequence adopted by the American Ornithologists' Union.[1]

Order—Pygopodes. Diving Birds

General Description. The Divers, a rather heterogeneous order, are birds fitted for sub-aquatic pursuits. The hip-joint is set far back on the body and the leg mechanism is better fitted for swimming than for walking. The tarsus, the visible part of the leg, is much flattened (Figure 2, page 23), and the toes are either partly (Figure 13, page 25) or completely (Figures 2 and 6, pages 23 and 24) webbed. The wings are small in comparison with the size of the body. The bill is straight and usually tapered, moderately long, but occasionally flattened and deepened, as in the cases of the Auks and Puffins; in the latter species this specialization reaches its highest development in the order.

Distinctions. Toes, three or four entirely or partly webbed, tarsus flattened, tail inconspicuous or small.

Field Marks. Small wings and tail; and straight, narrow bills—not duck-like. The Divers bear a superficial resemblance to Ducks, but where Ducks would fly the Divers dive.

Nesting. In the immediate vicinity of water on reedy shores or rocky ledges, or crevices and holes in the ground.

In consequence of the peculiar leg construction, an unusually upright carriage of body is necessitated when on land, and the birds walk with difficulty. Indeed some species are almost helpless on the ground and are unable to rise into the air except from the water, off steeply rising ground, or against a strong head wind. They swim and dive with ease, and, though their wings are small in proportion to the size of the body, when once on the wing they fly with rapid beats, swiftly and strongly, in straight lines or long curves without evolution or manœuvring.

Economic Status. The Diving Birds feed almost entirely upon aquatic life, usually captured by diving and pursuit under water. Economically, they are of slight importance. The Canadian representatives of this order at present recognized in American Check-list are divided into three families: the Grebes, *Colymbidae;* the Loons, *Gaviidae;* the Auks, Murres, etc., *Alcidae.*

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[1] Check-list of North American Birds.

SUBORDER—COLYMBI. GREBES

FAMILY—COLYMBIDAE. GREBES

General Description. Grebes are divers with feet lobed and not fully webbed, and without perceptible tails. Instead of full webs extending from toe to toe, as in most swimming birds, the digits are provided with a scalloped edging of flat, lobe-like flaps or processes hinged to the toe. These make excellent paddles during the stroke and, folding away, offer the minimum of resistance to the water on the return. Their wonderful diving ability has given these birds the common sobriquets of Hell-diver, Water-witch, etc., but they are almost helpless on land All our Grebes have the secondaries more or less tipped with white, making a white border to the spread wing, absent in the Loons.

Distinctions. Scalloped toe webs (Figure 13, page 25), short tail, straight, pointed bill, and the peculiar silvery sheen of the feathers of the underparts.

Field Marks. Pointed bill and inconspicuous tail. Feet carried straight out behind when flying.

Nesting. In reeds or rushes bordering sloughs or ponds, on floating or stationary heaps of vegetable matter.

Distribution. Grebes are distributed over the whole of Canada, well into the Arctic zone. In the breeding season they are generally more common on fresh, than on salt, water.

Grebes are, typically, inhabitants of fresh ponds and lakes, though at times they frequent the sea in numbers. The adults are coloured in rather broad masses; the young usually show sharp stripes, especially about the head, indicating that the family has descended from a common striped ancestor. The Grebe breasts, so much used for trimming and millinery purposes, are procured from birds of this family. The former sacrifice of large numbers for this purpose and the continued drainage of many of their natural breeding grounds have greatly reduced their numbers.

Fortunately the Migratory Birds Convention Act with the United States protects these birds at all seasons of the year over most of the continent and their slaughter for millinery purposes is happily now a thing of the past.

Economic Status. Feeding almost entirely upon water-inhabiting creatures they are of little direct economic importance. Considerable masses of feathers are found in many Grebe stomachs, but the reason for their presence is not yet perfectly understood. They are commonly feathers from the bird's own body and it has been suggested by Wetmore, "Condor," 1920, pages 18-20, that they serve as a plug to prevent fish bones from being carried from the stomach into the intestine before they are properly softened by digestion. Why such mechanical assistance is necessary in only certain divisions of birds is an enigma.

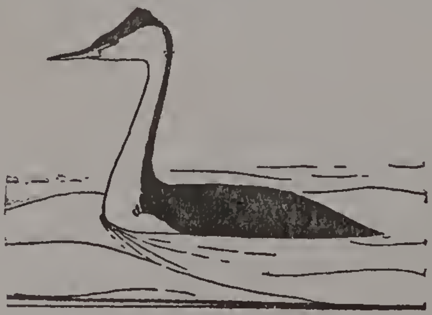


Figure 71
Western Grebe, swimming;
scale, about $\frac{1}{10}$.

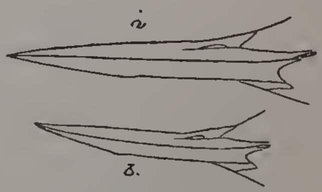


Figure 72
Types of bill of Western
Grebe; scale, $\frac{1}{3}$.

1. **Western Grebe.** SWAN GREBE. *Aechmophorus occidentalis.* L, 27·25. This and Holboell's Grebe are the largest of our native Grebes; the Western measures the longer because of its great length of slender neck. This Grebe is in all plumages a pure black and white bird (Figure 71) without variation of colour. It has slightly developed crests over each ear.

Distinctions. Size, long slender neck and pure black and white coloration distinguish this from all other of our Grebes. The bill is exceptionally long and pointed, and occurs in two types without apparent connexion with sex, age, or geographical distribution (Figure 72). One large and straight (a), and the other small and recurved (b).

Field Marks. Size, sharply contrasted black and white coloration, and long graceful neck that suggests its popular name of Swan Grebe. The black cap, descending in a sharp line down the back of the neck, and slight ear tufts, make this bird very distinctive in life. The white patch in the open wing will distinguish this bird from any of the smaller Loons in flight. The presence of only one wing patch will separate it from the Holboell's Grebe which has two white areas on each wing.

Nesting. On floating or stationary masses of dead reeds or tules in wet marshes about freshwater lakes, in some cases in communities so dense that one can almost step from nest to nest.

Distribution. Westward from the beginning of the prairies in Manitoba to the Pacific coast, north not far beyond the southern edge of timber. Though rather common on the lakes and seacoast of British Columbia all summer it has never been found nesting in that province.

One of the most gracefully beautiful and characteristic birds of the prairie sloughs. While the females are performing the duties of incubation in the marshes, the males, non-breeding birds, or those on relief, are to be seen floating about the open water, curling their sinuous necks with graceful ease and occasionally uttering a fine, high "*Krik-a-all*" that can be heard a considerable distance and is quite different from the raucous cries of some of their near relatives.

2. Holboell's Grebe. RED-NECKED GREBE. *Colymbus holboelli.* L, 19. This is one of our two larger Grebes (*See* Western Grebe). Summer adults have a jet black cap continuing down the back of the neck, white cheeks and throat faintly tinted with grey and a rich chestnut-red neck (Figure 73).

Distinctions. Size will distinguish this Grebe from all but the Western, and colour from the Western. Juveniles generally have a suggestion of rufous mixed with the dull grey neck, but are otherwise similar to the young Western, though colours are less contrasted and more blended.

Field Marks. The pearly grey or silvery white cheek patch against the darker crown and neck makes the adult recognizable at long range. The shorter, greyer, and less graceful neck will separate the juvenile from the Western Grebe, and the white wing patches, shown in flight, will distinguish it from any of the Loons. In flight Holboell's Grebe shows two white areas on each wing, that on the forward edge of the limb from wrist to body is very striking and characteristic.

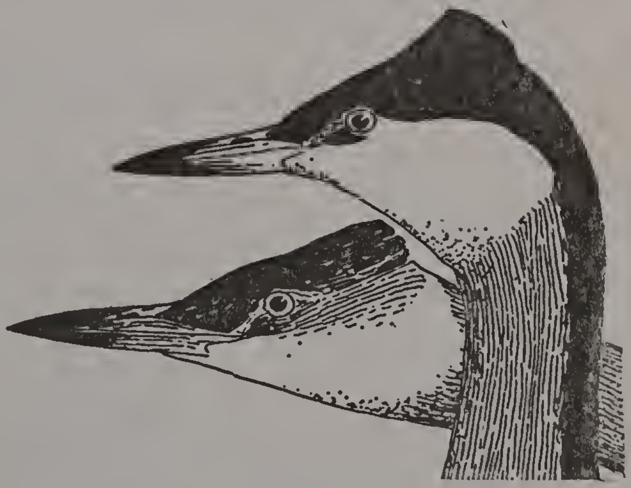


Figure 73
Holboell's Grebes; scale, ½.
Winter Summer

Nesting. On floating or stationary vegetable compost or marshy islets near the shores of freshwater lakes.

Distribution. Across the continent, breeding along our western southern borders northward.

This Grebe in the breeding season is commonly seen on all the prairie sloughs. Those who live close to such localities have probably heard its loud raucous notes and perhaps have wondered whence they came.

3. **Horned Grebe.** *Colymbus auritus.* L, 13·50. The Horned Grebe is about the same size as the Pied-billed and Eared Grebes mentioned next. The Horned and Eared Grebes have a general similarity of appearance, and both have sharp, slender bills instead of high, stumpy ones like the Pied-bill. The Horned Grebe has a rich chestnut neck and flanks, and full black, outstanding ruff from throat to hind head (Figure 74), where it joins with and supports light ochre ear tufts or "horns". In autumn and winter it is a black (or grey) and white bird very similar to the juvenile of the Eared (*See* Plate I A), but quite different from the browner, more rusty-necked Pied-bill.

Distinctions. Its sharp, slender, bill will distinguish it in any plumage from the Pied-bill. From the Eared, which more closely resembles it in summer plumage, it is distinguished by its red instead of black neck, its full ruff, and light ochre ear tufts instead of golden cheek plumes. In winter and juvenile plumages its black and white coloration separates it from the dingier Pied-bill, and the bill when fully developed is a safe distinction from the Eared (Figure 75, compare with 76). The bill is somewhat shorter, and is a little higher than wide, instead of wider than high at the base. Immature birds, however, may be difficult of separation.

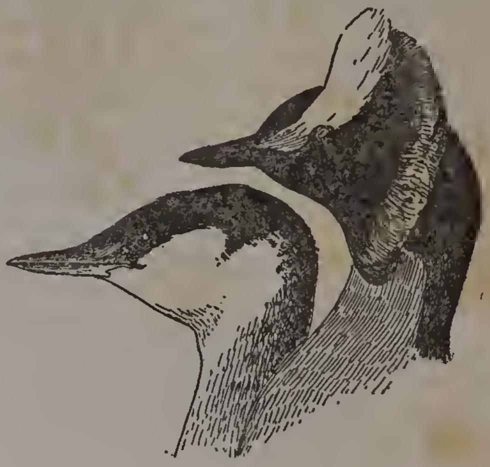


Figure 74
Horned Grebe; scale, ½.
Winter Summer

Field Marks. In adult: the large ruff, giving a "buffle-head" appearance, red neck, and light ochre ear tufts. In juvenility: the narrow pointed bill, and shiny white foreneck and breast, distinguish it from the Pied-bill, but not from the Eared.

Nesting. Similar to the preceding.

Distribution. Across the continent, breeding throughout the Canadian prairies and British Columbia north to the Arctic coast.

On migration the Horned Grebe prefers the larger bodies of water, but in the breeding season it may be found in almost any little slough or water-hole on the prairies or in British Columbia. The Eared and Pied-billed Grebes require considerable reed or tule marsh for nesting in, but the Horned Grebes in many cases nest in pools with bare shores and with little or no cover.

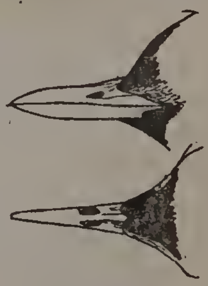


Figure 75
Bill details of Horned Grebe; scale, ⅓.

4. **Eared Grebe.** BLACK-NECKED GREBE. *Colymbus nigricollis.* L, 13·20. Plate I A. This, the smallest of our Grebes, is very similar to the Horned in size, general coloration, and the possession of a slender, sharp bill instead of a short, stumpy one like the Pied-bill. Like the Horned it has red flanks, but the neck is black and instead of the full ruff and ochre ear tufts it has a spray of golden plumes on the cheek and a helmet-like crest on the crown.

The juvenile and autumn plumage is quite different from the dingier and rustier Pied-bill, and similar to the young Horned, from which it is separated only with some difficulty by the bill characteristics. The bill of the Eared Grebe is longer and narrower and somewhat depressed at the base so as to be wider than high (Figure 76), instead of the converse (Figure 75).

Field Marks. General appearance of head and neck, the helmet-like crest coming to a point over the middle of the crown instead of over the hind-head as in the Horned Grebe, the absence of ruff and consequent lack of "buffle-head" appearance, and the presence of the spray of golden feathers on the cheeks instead of the ochre tufts over the ears. Silhouetted against the bright water the bill seems to have a slight retroussé effect not noticeable in other Grebes. In autumn it may not always be separable in life from the Horned.

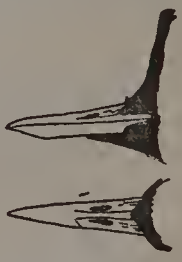
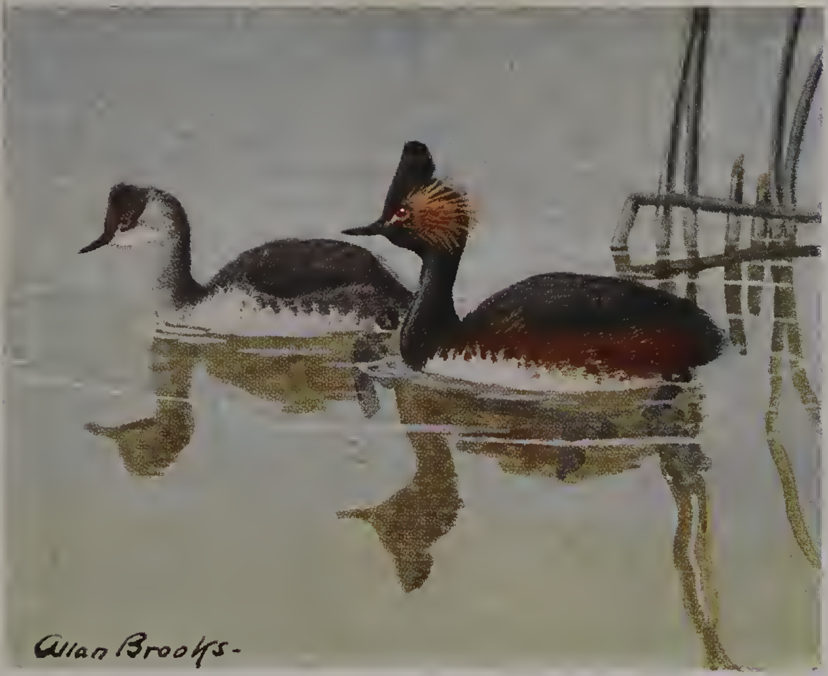


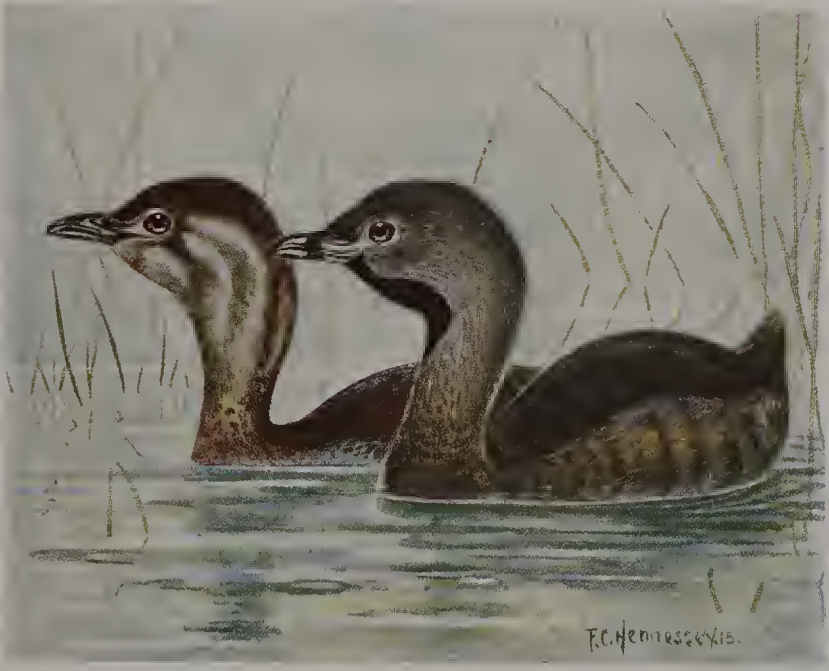
Figure 76
Bill details of Eared Grebe; scale, ⅓.

PLATE I



A. Eared Grebe; scale, $\frac{1}{6}$

In winter Summer adult


F.C. Hennessey XIS.

B. Pied-billed Grebe; scale, $\frac{1}{4}$

Juvenile Summer adult

Nesting. Breeding habits similar to the other Grebes, but often in communities so dense that a canoe can hardly pass between nests. It seems to require larger bodies of marsh and water in which to nest than the Horned Grebe, and often associates with nesting communities of Western Grebes.

Distribution. Temperate parts of the Northern hemisphere. In Canada, on the prairies and in southern British Columbia, breeding almost wherever found. Strangely enough it does not occur east of Manitoba even as a straggler.

SUBSPECIES. The Eared Grebe inhabits the Old as well as the New World. The American Eared Grebe is subspecifically separated from the European form under the name *Colymbus nigricollis californicus.*

6. **Pied-billed Grebe.** DAB-CHICK. HELL-DIVER. WATER-WITCH. *Podilymbus podiceps.* L, 13·50. Plate I B.

Distinctions. The Pied-bill can be separated from all other Canadian Grebes by its relatively heavier and stouter bill with its spot and more strongly arched culmen; from the juvenile Horned or Eared Grebes in any plumage, also by its darker and dingier coloured foreneck, breast, and underparts.

Field Marks. Size, high stubby bill, spot on bill, and in the spring adult, black throat patch. This Grebe is more often seen in flight than the others.

Nesting. Along the marshy edges of ponds and lakes on stationary or floating platforms.

Distribution. Across the continent. In western Canada north to Great Slave lake, breeding wherever found.

This Grebe frequents clear, open water less than do its relatives, and usually confines itself to open leads and lagoons in tule and cat-tail marshes. In its chosen habitat it is a wonderful hider, evading observation with almost mysterious elusiveness. The names Hell-diver and Water-witch are descriptive of its powers in this direction. No sooner does its quick eye discern an intruder than it gradually sinks low in the water until in some cases only the bill projects, in which position it may quietly await the withdrawal of danger or it may paddle without a ripple to some marshy cover where the eye cannot detect it. Diving at the flash of the gun, it is often safe under water by the time the shot reaches the spot it recently occupied, but the use of modern smokeless powder has put it at some disadvantage. Though seldom seen, and showing remarkable powers of vanishing amidst seemingly insufficient cover, its loud far-reaching voice is often heard and to many the origin of the sound is one of the mysteries that make the marsh so interesting. Its note may be rendered "*Kuck-kuck-kuck-Gulup-gulup-gulup,*" with a rising inflection in the series of "*kucks,*" which are repeated quickly, then a slight pause, and the "*gulups*" uttered with even tempo and with strong accent on the liquid letters. It can be heard under favourable conditions for a mile or more.

SUBORDER—CEPPHI. LOONS AND AUKS

FAMILY—GAVIIDAE. LOONS

General Description. The Loons are large Divers, with straight, sharply pointed bills and with the feet fully webbed (Figure 2, page 23). In the adult state they are coloured in strikingly contrasting patterns, mostly black and white.

Distinctions. Larger than Ducks and with shorter necks than Geese. These points and the sharp, pointed bill are diagnostic. Tails more evident than in the Grebes.

Field Marks. Size, length of neck, and bill. In flight, the feet are trailed behind the tail.

Nesting. On low shores, in the immediate vicinity of water where they can dive almost directly from the nest.

The Loons are probably even better divers than the Grebes, but they rise less easily from the water, and unless there is a good breeze that they can face, require a long splashing start over the surface before being wing-borne.

Economic Status. Their food is composed almost entirely of fish, but owing to the small number of loons usual in any one locality, their direct economic importance is small.

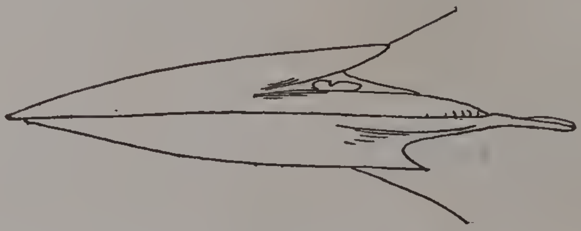


Figure 77
Bill outline of Common Loon; scale, ½.

7. Common Loon. LOON. GREAT NORTHERN DIVER. *Gavia immer.* L, 32. Plate II A.

Distinctions. The summer adult Common Loon is easily separated from any of the other Loons, except the Yellow-billed, by its marked coloration, but young birds may be more difficult to differentiate. From the Yellow-billed, which is but slightly larger, adults may be separated by black instead of yellow bill and green instead of purple reflections on the throat. Juveniles and summer adults have rather pale bills and the shape, slightly arched instead of straight culmen (compare Figure 77 with Figure 78), is probably the best distinction. As the latter occurs regularly only in the far north there is little opportunity for confusing these two.

From the immature of the Red-throated Loon young birds may be told by size and their lack of small, sharply-defined white spots on the back. From the juvenile Black-throated or Arctic Loon, size appears to be the only reliable criterion in immaturity or winter.

Field Marks. All black head, throat, and bill. In juvenility or in winter plumage, size, and unspotted back. Most of the Loons seen on our inland waters are this species.

Nesting. On the boggy or rocky shores close to fresh water where, when alarmed, it can slide directly into the water. The rather bulky nest is built of decaying vegetable matter.

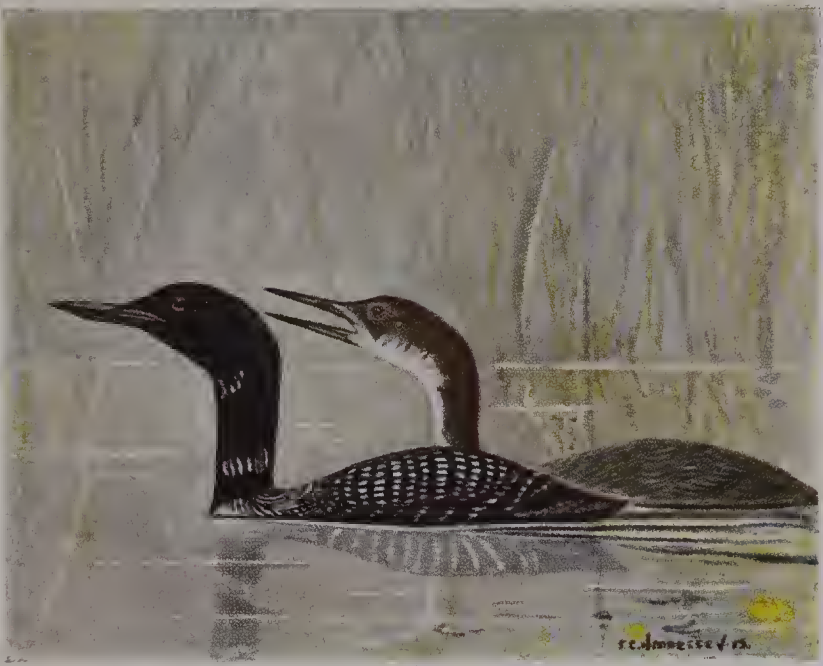
Distribution. Over the whole of Canada, breeding wherever conditions are suitable and the birds are not disturbed. In many cases they remain in winter as long as the water is open.

Most frequenters of our waterways and lakes are familiar with the long, loud laugh of the Loon. The Loon has many other strange wild notes; among them one beginning low, rising high, and then dropping suddenly. It is often noisy at night or just before a storm and birds frequently call to and answer one another across the water.

Owing to the constant encroachments of settlement, and the consequent disturbance of its nesting places, the Loon has been growing scarcer of late years, and in many of its old haunts it is now seldom seen except during migration. However, there are still many lonely lakes in the great uninhabited north where it can live and breed undisturbed, and the immediate loss of this picturesque species need not be anticipated. Proper local protection, enforced by an awakened public opinion, would undoubtedly restock our lakes and ponds in summer as well as augment the number that make passing visits. Loons are strictly protected at all times by the terms of the Migratory Birds Convention Act. They may be legally killed nowhere in either the United States or Canada. Under the terms of this treaty, only where their depredations are proved to be serious can permits be issued for their destruction.

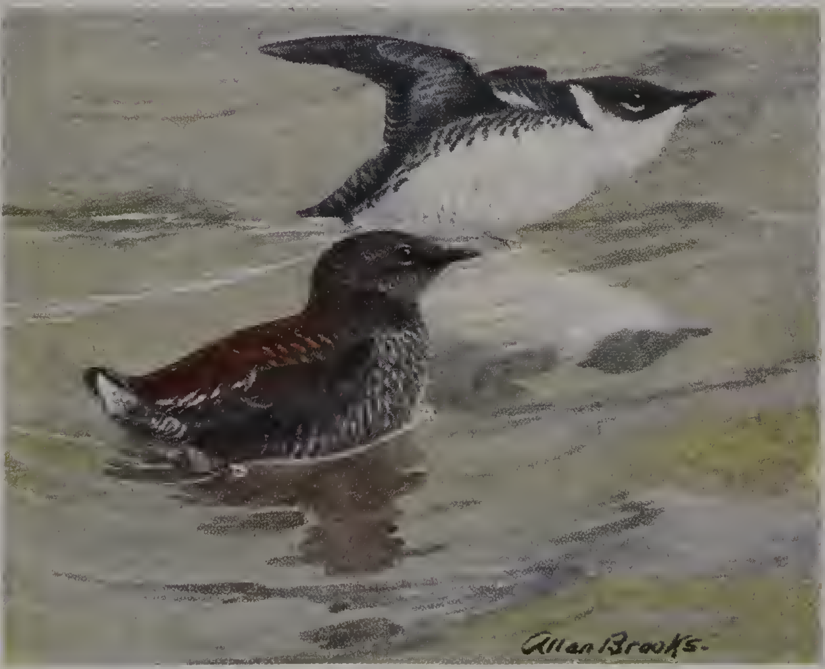
The damage to game fish charged against Loons by anglers may locally have some foundation in fact, but is often subject to exaggeration. The failure of fish supplies may commonly be attributed to every possible cause except the most important one, viz., human over-fishing. Too

PLATE II



A. Common Loon; scale, $\frac{1}{9}$

Summer adult Juvenile



B. Marbled Murrelet; scale, $\frac{1}{6}$

Young in winter

Summer adult

often any fish-eating bird or beast is looked upon by self-centred anglers as an intolerable rival to be suppressed at any cost; irrespective of the relative importance of its depredations. Loons are probably no respecters of any species of fish as species, but they do not frequent swiftly running streams such as trout inhabit nor are they often seen in the marshy shallows where game fish usually lurk. By preference they keep to open, fairly deep water and their prey is mostly fish of small size and of the coarser and less gamy varieties. In cases where Loons do occur on limited or special waters such as preserves or hatchery ponds, or even elsewhere, in abnormal numbers, they may interfere more or less seriously with special interests. Each such case, however, should be settled on its own merits in reference to the general good.

Many people get more enjoyment from the presence of Loons than from fishing and there are many out-door recreation centres where Loons give the last touch of native wildness to the picture. The requirements of those people for the enjoyment of such places are as worthy of recognition as those of fishing enthusiasts and should be carefully considered.

General destruction of Loons, as has been and is being constantly advocated, is like stopping a small crack in the barrel whilst the bung-hole remains open. Fish were plentiful originally in spite of the Loons and if proper fishing regulations were enforced and the purity of the waters preserved the number of small fry taken normally by Loons would rarely be missed. In specific and special cases some control may be advisable.

On some of the smaller lakes, Loons have an effect on the other bird life. They are impatient of too close neighbours and are likely to drive away nesting Ducks, Coots, and similar water-birds. They make their attack from under water and harry the objects of their jealousy until they vacate the premises and leave the Loon in sole possession. Waters that Loons choose for a home, however, are, with some local exceptions, not particularly attractive to other water birds and this trait can generally be looked upon with curious interest rather than animosity by the bird lover or sportsman.

Economic Status. Although the Loon is a large bird the capacity of its gullet limits the fish it takes to comparatively small sizes. This fact, taken in connexion with the small number of birds on the smaller lakes and the immense numbers of fish in the larger bodies of water, makes its depredations economically unimportant. The species, therefore, should not be destroyed.

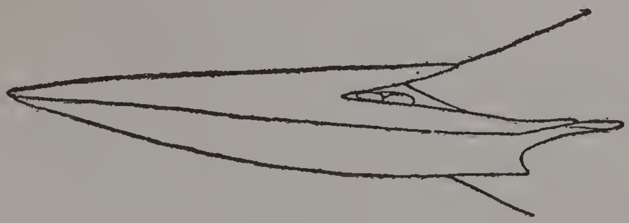


Figure 78
Bill outline of Yellow-billed Loon;
scale, ½.

8. **Yellow-billed Loon.** *Gavia adamsi.* L, 36. In general this is a big Common Loon with bill ivory-yellow instead of black.

Distinctions. In full plumage easily known from the Common Loon by its size and yellow bill. The reflections on the throat are purple, instead of green. In immaturity when size s not a reliable specific guide, the bill shape offers the best distinction. In the Yellow-billed the culmen line is almost straight, whereas in the Common Loon it is slightly arched (Figure 78, compare with Figure 77). This will probably separate all specimens except those that have not quite acquired their growth.

From the Arctic or the Red-throated Loons size is sufficient distinction.

Field Marks. Large size and conspicuous yellowish white bill are said to make excellent field marks for the adult.

Nesting. Practically unknown, but probably similar to that of the other Loons.

Distribution. The northwest Arctic coast and the great lakes of Mackenzie, probably nesting on the ponds of the tundras where no one goes in summer time.

The migrations and breeding range of the Yellow-billed Loon are among our unsolved ornithological problems. It evidently winters in some numbers, at least occasionally, on the south Alaskan coast, but we have no British Columbia records. It should be looked for there with care, but identified with caution.

9. **Arctic Loon** (Including **Black-throated Loon** and **Pacific Loon**). *Gavia arctica.* L, about 24. Similar to, but smaller than, the Common Loon, from which it differs in colour principally on the crown and hindneck (Figure 79), which is dark grey on the forehead but gradually becomes a light smoky ash down the hindneck.

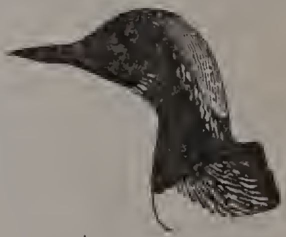


Figure 79
Arctic Loon; scale, about ¼.

Distinctions. General colour as above, in adults. Juveniles are distinguished from the Common Loon by their distinctly smaller size and from the Red-throated Loon, with which they agree closely in that particular, by the general coloration; in juvenility and winter plumages, by the lack of fine V-shaped white specklings on the back.

Field Marks. The grey hindneck and black throat and foreneck should make excellent field marks in life. In juvenile plumage, size separates from the two big Loons and, when determinable, the unspeckled back from the Red-throated.

Nesting. Similar to the other Loons.

Distribution. In summer an inhabitant of the far north from lake Athabaska northward. In migration rarely down through the prairies, but wintering in numbers on the British Columbia coast.

SUBSPECIES. The Arctic Loon is a circumpolar species. The common American form is the Pacific Loon *Gavia arctica pacifica*, given in the Check-list as a full species, but now generally acknowledged to be only subspecifically distinct from the Black-throated Loon of Europe that has crown and hindneck uniformly coloured. A third, Asiatic race, *G. artica viridigularis*, has been described recently and should be looked for on the west coast. It is characterized by having green instead of purple reflections on the throat.

11. **Red-throated Loon.** *Gavia stellata.* L, 25. This is similar in size to the Arctic Loon and decidedly smaller than the Common Loon. It is without the intensely black and white colour pattern of either. The head and neck of the adult are of soft, even slate grey with a maroon-red throat patch (Figure 80). The back is an even greyish brown, the rest of the body being white.

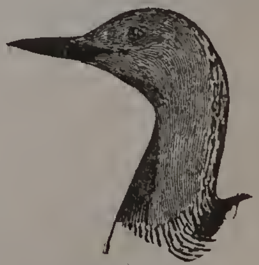


Figure 80
Red-throated Loon; scale, about ¼.

Distinctions. The colour pattern is absolutely distinctive in the adult. Juveniles and winter birds are without the grey neck and red throat, these colours being replaced by white which continues unbrokenly from the underparts, producing a coloration very similar to the Arctic except that the back is sprinkled with small white specklings instead of grey feather edgings. The species is so much smaller than the two large Loons that there can be little confusion with them.

Field Marks. The grey head and neck, red throat patch, and evenly coloured back make good field marks for the adult. In juvenility and in winter, size should separate it from all except the Arctic Loon; when it can be seen the finely speckled back is conclusive.

Nesting. Similar to the preceding species.

Distribution. Ranges over the whole of Canada, scarce in the interior, more common on either coast. Breeds north of regular settlement to the Arctics.

FAMILY—ALCIDAE. AUKS, MURRES, AND PUFFINS

General Description. This family is composed of strictly maritime species of rare or only accidental occurrence on fresh water. Though most at home in the water, they stand upright on land and walk about with considerably more ease than do the Grebes or Loons. Their bills are subject to a greater degree of variation than the aforementioned families, ranging from the straight, tapering shape of the Murre (Figure 88) to the deeply compressed bill of the Puffin (Figures 81 and 82).

Distinctions. The obvious diver-like form, combined with webbed feet and no hind toes (Figure 12, page 25), is diagnostic.

Field Marks. General resemblance to Ducks, but the short necks, and pointed and in some cases deepened and flattened bill of the family are characteristic.

Nesting. Breed in large colonies, many of mixed species, on rocky islets or inaccessible sea-washed cliffs. Build no nest, but lay their eggs directly on the ground. Eggs are unusually large for the size of the bird and markedly pyriform, a shape that causes them to roll in circles rather than in straight lines and lessens the danger of their falling from the bare, rocky, nesting ledges.

Distribution. Along the seacoast to the Arctic, rarely occurring on fresh water. There is considerable doubt expressed at present as to the inclusion of this family in the same order as the Grebes and Loons. The consensus of opinion seems to favour a closer relationship with the Gulls. Until a new and revised Check-list is brought out, however, it seems inexpedient to depart from the system that is familiar to most readers.

This family frequents the open sea, coming ashore only to breed. The birds differ from the other Divers in habitually using their wings under water as in flying. In primitive Indian and fishing communities Sea-Divers and their eggs have in the past been much used for food. In certain localities, they may still be a most important food supply for tribes who have little other source of fresh meat and who have depended upon them from time immemorial. It is not suggested that they are legitimate food supply for white men, who are expected to provide themselves with other supplies beforehand. These birds are protected under the Migratory Birds Convention Act and cannot legally be killed anywhere or at any season in United States or Canada, except for personal consumption by certain Eskimos and Indians.

Economic Status. Eating nothing but the smaller sizes of fish and crustaceans taken at sea, where the supplies are more than ample, there is little harm that these species can do. A new and modern enemy of these birds is the oil-burning ship. These have been in the habit of filling their fuel tanks with water as the oil is burned. On approaching harbour, or before refueling, this water is discharged into the sea and with it large amounts of oily waste and sludge, which floats on the surface and thoroughly permeates the plumage of any birds swimming in it, quickly causing their death. A comparatively small amount of oil will cover a vast extent of sea and at times thousands of sea birds have been killed in this way. Steps have been taken to prevent this pollution of the sea, and the danger to birds is being controlled. However, unavoidable loss of oil by such accidents as wrecks, and occasional violations of the law, still destroy numbers of birds every year.

Subfamily—Fraterculinae. Puffins

The Puffins are stockily built sea birds and like the others of the family strictly confined to salt water. Their striking peculiarity is a highly coloured and tremendously exaggerated bill. This is triangular in profile, nearly as deep as long, flattened, and knife-like in section. In winter, Puffins shed most of the brilliant plates that form their extraordinary bill and consequently at that season it is much reduced in size and coloration. However, immediately after the nesting season, Puffins go out to sea, where they scatter and are seldom seen in that condition.

12. **Tufted Puffin.** *Lunda cirrhata.* L, 15·50. A very dark brown bird, almost black on back and crown, with white face, and in full plumage with long, sweeping, plume-like crests of straw yellow, springing from behind and over the eye, falling almost to the shoulders. The bill is nearly 2 inches high at base and 2½ long, and coloured bright red (Figure 81). An altogether extraordinary looking bird.

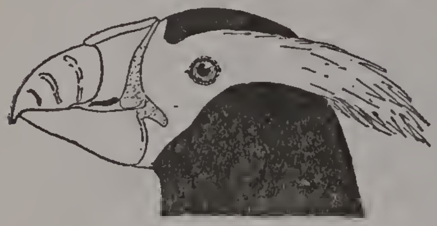


Figure 81
Tufted Puffin; scale, ½.

Distinctions. Enormous red bill, dark underbody, and long, sweeping, straw-coloured crests. Young Tufted Puffins, before the large bill has developed, are very like young Rhinoceros Auklets, but lack the horn on top of bill (*See* Figure 83) which is rudimentary even at that age in those birds.

Field Marks. The striking, coloured bill is conspicuous in the Puffins in life. The distinctive character of this species is probably the dark underbody, instead of white as in the next species, and the conspicuous light-coloured crests.

Nesting. In cracks and crannies of rocks, or in burrows in the ground. Cliffs or steep banks preferred.

Distribution. The Pacific coast of North America, breeding from California to Bering sea.

The known breeding grounds in Canada of these striking and interesting birds are about the south end of Vancouver island, the Triangle, and Queen Charlotte islands. Others no doubt exist.

14. **Horned Puffin.** *Fratercula corniculata.* L, 14·50. A slightly smaller Puffin than the Tufted, but with a similarly flattened and deepened bill. The whole face is pure white (Figure 82), as is the underbody, and there are no crests.

Distinctions. The black neck and throat and white underbody in contrast with the all-black body of the preceding species, the only bird likely to be confused with it, are unmistakable. It gets its name of "Horned" from the peculiar excrescent growth from the eyelids, one process of which projects upward nearly half an inch like a rather flaccid, erectile horn.

Field Marks. Puffins in summer are always recognizable by their big, showy bills. The white instead of almost black underparts should be distinctive from the previous species.

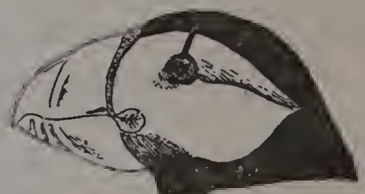


Figure 82
Horned Puffin; scale, ½.

Nesting. In crevices in sea-cliffs or in burrows in the ground.

Distribution. Coast and islands of Bering sea south just to Canadian territory. We have no substantiated breeding records in Canada.

This Puffin probably migrates in winter seaward rather than south along the coast and we have no record of it for southern British Columbia. It should be looked for along the outer coast of Vancouver island.

Subfamily—Aethiinae. Auklets. Murrelets. Guillemots

This subfamily is composed of the smaller members of the family—as their names imply—the little Auks, Murres, etc. In general structure and habits they are but smaller representatives of their larger relatives.

15. **Rhinoceros Auklet.** *Cerorhinca monocerata.* L, 14·50. One of the larger members of the subfamily. Dark smoky brown, slightly lightening on foreneck, breast, and flanks and pure or dirty white below. In breeding plumage, there are remarkable sparse sprays or tufts of white plume-like feathers extending from above the eye and the angle of the mouth back and downward (Figure 83). The name "Rhinoceros" is obtained from the single upstanding process at the base of the culmen, nearly half an inch high and half as wide. In winter, the plumes and horn are usually shed, the horn being indicated then and in juveniles only by a small, soft knob.

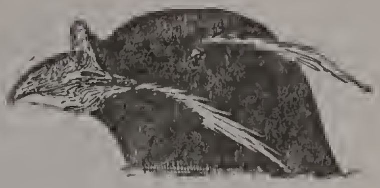


Figure 83
Rhinoceros Auklet;
scale, ½.

Distinctions. Size, general smoky-brown coloration with light underbody, and the rhinoceros horn or knob at base of upper mandible.

Field Marks. Probably in life to be confused only with the Puffins or the Murres. When seen, the horn or face tufts should be determinative. Has not the big, highly-coloured bill of the Puffins. Larger than the Auklets and Murrelets, smaller than the Murres and more stubby in build, especially about the head. Of different colour from the Guillemots. No bright colour anywhere.

Nesting. In burrows in the ground, usually in steeply sloping banks facing the sea.

Distribution. Coast and islands of the north Pacific. Breeding from Sitka south to Washington.

We have few actual breeding records for the species in British Columbia. There are colonies, however, about the south end of Vancouver island and elsewhere in the lonelier spots along the coast between Vancouver island and the Alaska boundary.

16. **Cassin's Auklet.** *Ptychoramphus aleuticus.* L, 8·75. The smallest of the Divers commonly occurring on the Pacific coasts of Canada. The only other Diver that is smaller is the Least Auklet which so far has not been detected in our waters. Above, black, greying on back, deepest on crown, lightening across face and throat to ashy grey (Figure 84) and blending into white underparts. Small white spots over and below the eye. Juveniles are similar but brownish instead of blackish and without the loral spot.

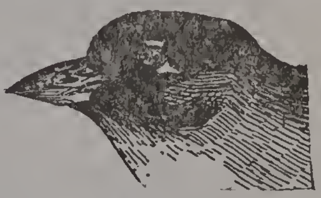


Figure 84
Cassin's Auklet;
scale, ½.

Distinctions. Small size, light ashy or brownish grey throat, and small white spot over and below the eye.

Field Marks. Small size and dull, obscure coloration.

Nesting. Burrows in the ground and in some cases in niches and crevices in the rocks. Often in large communities.

Distribution. Breeding from Lower California to the Aleutian islands. North of California very local in distribution. The only ascertained nesting record known in British Columbia is at the north end of Queen Charlotte islands.

This little Diver should be noted more often than it has been along our coast, especially on the outer shore of Vancouver island where breeding colonies will probably be found.

17. **Paroquet Auklet.** *Phaleris psittacula.* L, 9·75. Adults: head, neck, and back dull brownish; all below white. Bill small, bright red, and with cutting edges peculiarly upturned. A narrow spray of fine white plumes extending backward from under the eye (Figure 85). Juvenile and winter plumage: with white invading the dark foreneck and without facial plumes.

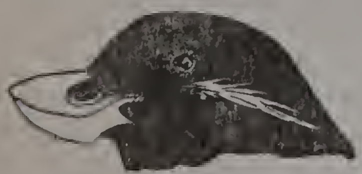


Figure 85
Paroquet Auklet;
scale, ½.

Distinctions. Small size, little red bill, and facial plumes.

Field Marks. Small size, dark head, neck, and back, with white underparts, and little red bill should be distinctive in suitable circumstances.

Nesting. Under stones or in clefts in the rocks.

Distribution. Northern Pacific and Bering Sea coasts of Alaska. This bird has been noted at Forrester island, across Dixon entrance from Queen Charlotte islands, and also in the strait of Juan de Fuca and must eventually be taken along the intervening coast, though up to the present it has not been recorded.

21. Ancient Murrelet. *Synthliboramphus antiquus.* L, 9·50. Adult in summer: slaty blue above; white below; head, hindneck, face, and sharply defined throat patch pure black (Figure 86b). A few small, white, lanceolate feathers forming stripe back from over eye and scattered through black at base of hindneck. Juvenile plumage similar (Figure 86a) but black restricted, the throat and side of neck being conspicuously snowy white. None of the little white feathering in the black.

Distinctions. The sharply defined black and white coloration of the head and foreparts. Winter juveniles are quite similar to winter Marbled Murrelets (*See* Plate II B) in size and general coloration, but the back is pure even slate grey without white stripes over the wings and the black of the face includes all in front of the eye, without the loral spot, and extends in light smokiness across the chin. The bill is also much shorter and proportionally deeper.

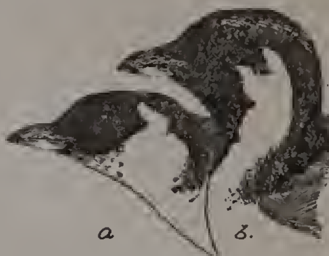


Figure 86
Ancient Murrelet; scale, ½.
a, Juveniles and winter;
b, Summer.

Field Marks. In the case of the adult the intense black head contrasted with the pure white foreparts should be very conspicuous in life.

Nesting. In burrows in the ground.

Distribution. Breeds on the Pacific coasts of Alaska south to Queen Charlotte islands and migrates down to southern California.

This little Murrelet breeds on Forrester island across Dixon entrance from the Queen Charlottes, but has not yet been known to nest within our borders, although it frequents our waters in winter.

23. Marbled Murrelet. *Brachyramphus marmoratus* L, 9·50. Plate II B. Adult in summer: all wood brown with reddish feather edgings on back and mottled softly with white on forward and under surfaces. Juveniles and in winter: blackish above, deeper on crown, and white below to chin.

Distinctions. Similar in size and, in winter, in colour, to the Ancient Murrelet, but with longer and more slender bill. Winter birds otherwise differ from that species in having white chin and lores, back slightly bluish on feather edges instead of solidly so, and a broad white line on the back over the folded wing.

Field Marks. In the summer adult, its small size and general blackness. Also the perky way in which it carries its bill and tail cocked up when sitting on the water. In winter plumage, when Ancient Murrelets are about, probably the small amount of black on the head and the less sharply defined pattern are the best distinctions.

Nesting. Unknown.

Distribution. The Pacific coast of Alaska to the state of Washington, wintering to southern California.

All summer the strait of Georgia, especially along the edges of the kelp beds, may often be sprinkled with these little sea birds. They scatter over the smooth surface in fine weather, generally in pairs, floating high and lightly, with bill and tail cocked up at a perky angle, and converse in low, soft whistles. On being approached by a boat, they seem indifferent at first, but gradually grow uneasy and circle with increasing confusion. Just as their panic seems to culminate, and they are apparently in doubt where next to turn, they bethink themselves of the safe green depths and, with a forward spring, a partial opening of the wings, and a little splash, they dive with an unexpected suddenness which suggests that a new and entirely unlooked for discovery in the tactics of escape has just been made.

Though they are common and in full breeding plumage throughout the summer we still know almost nothing of their nesting. That they breed nearby is evident, but the nest and its situation have yet to be discovered. Birds with eggs ready for deposition have been taken from the south end of Vancouver island northward and a complete egg was taken from one near Prince of Wales island, southern Alaska. All along our coast, birds may occasionally be seen in flight carrying fish shorewards or into the forest. At the north end of Queen Charlotte islands, an almost fresh egg which agreed with the postmortem specimen from Prince of Wales island, and which was neither of Cassin's Auklet nor Ancient Murrelet was found in a burrow in an Auklet colony. Details of the nesting of the Marbled Murrelet is one of the desiderata of west coast ornithology.

29. **Pigeon Guillemot.** *Cepphus columba.* L, 13·50. In summer (Figure 87a): solid greyish black with conspicuous white wing patch and bright red feet and legs. Juveniles (Figure 87b) and winter birds: underparts white, above mostly black, but the white feathers are tipped with black and the black ones broadly edged with white, the wings being as in summer.

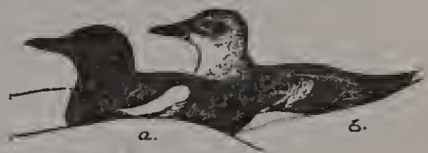


Figure 87
Pigeon Guillemots; scale, ⅓.
a, Summer; *b*, Juvenile and winter.

Distinctions. Colour in summer is absolutely distinctive. In autumn and winter the blended coloration and heavy frosting of the black are almost equally recognizable.

Field Marks. Summer adult: an all black bird with white wing patches and bright red feet. Too large for a Murrelet and too small for a Murre.

Nesting. In crevices of the cliffs and under rocks on steep shores.

Distribution. Coasts of Bering sea and the Pacific ocean south to California.

One of the commonest inhabitants of our seacoasts and familiar to all who frequent them. It is less gregarious than many of its relatives and nests alone rather than in rookeries, though sometimes common interest attracts numbers to limited localities.

This is the western representative of the Black Guillemot of the Atlantic, *Cepphus grylle,* from which it differs only in having the white wing-spot divided by a black bar.

Subfamily—Alcinae. Auks and Murres

30. **Common Murre.** (Including **California Murre.**) *Uria troille.* L, 16. The Common Murre in summer is white below, with head and neck dark seal brown, and back and wings black. In winter the throat is light (Figure 88) veiled with more or less greyish, and the brown is replaced with black almost unicolour with the back.

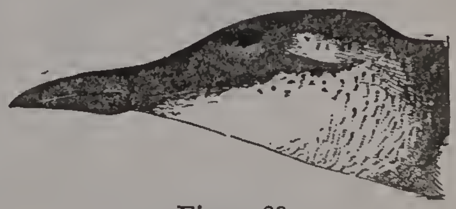


Figure 88
California Murre; scale, ⅓.
Winter.

Distinctions. The Murre can hardly be confused with anything on the British Columbia coast except the Thick-billed Guillemot (*Pallas' Murre*) which may occasionally occur in winter, though it has not as yet been so recognized. It is very similar to this species, but has a shorter, thicker bill.

Field Marks. Murres are rather easily recognized in life by general characteristics and size. The otherwise strongly characterized Tufted Puffin is the only sea-diver that approaches it in size. The Rhinoceros Auklet has a general resemblance to it, but is much smaller and has a short bill and an evenly dark greyish throat.

Nesting. In large colonies amongst rocks and crevices in bold sea faces.

Distribution. The coast and islands of Bering sea and the Pacific south to California. Probably on British Columbia coasts, generally confined in breeding season to the outer shores of the islands and mainland and seldom seen on the inner channels except in winter.

SUBSPECIES. The subspecific representative of the Common Murre on the west coast is the California Murre *Uria troille californicus.*

The number of Murres that find breeding room on some sea-cliffs is astonishing. At the edge of the rocky shelves they gather as closely as they can stand, like files of soldiers, bearing strong resemblance to the lines of Penguins that we see in pictures from the Antarctic.

Order—Longipennes. Long-winged Swimmers

General Description. The Long-winged Swimmers are sea birds, with four toes and two webs, and with the closed wings projecting beyond the tail, if the excessively lengthened middle tail feather of some Jaegers and the equally elongated outer swallow-tails of some Terns are disregarded.

Distinctions. Can be recognized as an Order by their long wings and bill characters (Figures 89 to 102), and are separated from the Tube-nosed Swimmers by the position of the nostrils which are in the sides of the bill and not in a tube on top (*See* Figures 103 to 107, pages 66 to 69, for comparison).

Field Marks. No field marks can be given covering the order except length of wing and mode of flight.

Nesting. Usually breed on the ground or on cliff ledges, but there is little uniformity in their nesting habits.

Distribution. Some species are more or less common over all the waterways of Canada.

The Long-winged Swimmers are wonderful fliers, being both tireless and agile on the wing. In habit they are fishers, scavengers, or pirates. There are only two families of the order in Canada; the Jaegers *Stercorariidae* and the Gulls *Laridae*, the latter including the closely allied Terns or "Sea Swallows."

All birds of this Order are protected by the Migratory Birds Convention Act and none of them may be killed legally in any part of the United States or Canada without special permission.

Economic Status. Being sea birds, the damage they do is slight and some of them are actively beneficial to man.

FAMILY—STERCORARIIDAE. SKUAS AND JAEGERS

General Description. The Skuas and Jaegers are predaceous sea birds and as such have strongly hooked bills. The feet, webbed like Gulls, are armed with small but sharp, strongly curved, raptorial claws. The Skuas occur only in a single dark coloration, but the Jaegers (except perhaps the Long-tailed) are dichromatic and show two distinct colour phases with various though less common intermediate stages between. The dark phase is almost evenly dark brown like the Skua, but usually faintly lightening on the face and showing a suggestion of dark cap. The light phase has white or light underparts, often more or less crossbarred with dark, especially on flanks, throat, and cheeks (Figure 89), the latter as a rule with a golden tinge, and showing a distinct black cap. Young birds are usually in the dark phase and more or less completely barred with dark, or feather-edged with light. The species of this family are so similar to each other in coloration that the above is descriptive of all of them and they are almost inseparable by colour characters.

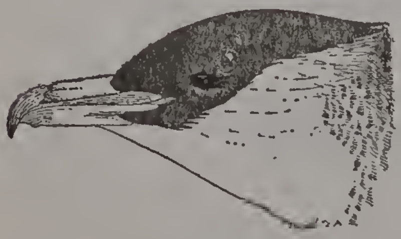


Figure 89
Jaeger, light phase; scale, ½.

Distinctions. The bills are diagnostic (Figure 89), there being a distinct nail at the tip forming a well-marked hook, plainly separable from the softer cere that occupies most of the upper mandible. This characteristic easily distinguishes them from the Gulls, whereas the presence of nostril openings at base of the hook and two instead of three webs distinguishes them from the Cormorants which have bills similar in general outline (*See* Figure 108, page 71). That the nostrils are not in tubes and are at the forward end of the cere instead of at the base of it, differentiates them from the Shearwaters (Figure 106, page 68) and Petrels that also have hooked bills.

Field Marks. Jaegers and Skuas are sooty dark above and light or white below. In some all the body is evenly sooty in colour. Except the Long-tailed Jaeger all have a conspicuous light band (Figure 90) on the under-wing surface across the base of the primaries. They are very hawk-like in flight. Skuas are too rare with us ever to be recorded on sight evidence. The long central tail feathers (Figures 91-93) of the adult

Jaegers make good recognition marks. This characteristic tail is so conspicuous as to have suggested to sailors the colloquial names of "Mason" (referring to the trowel-like tail), "Bos'n" (from the tail like a marlin-spike, the special tool of a boatswain), or just "Marlin-spike."

Nesting. On the ground.

The occurrence of the two colour phases, as well as every possible intermediate plumage, makes the identification of some of the Jaegers a difficult matter. Skuas and Jaegers are pirates of the air; they pursue successful fishing birds and force them to disgorge the fish they have swallowed. Eggs and young birds in the nest are never safe from them.

Three Jaegers occur in western Canada and one Skua—the latter very rare.

Economic Status. The Jaegers are not very numerous and except in far away, wild localities, where numbers give them local importance, they are of no economic influence.

35. 1. **Chilean Skua.** *Catharacta chilensis.* L, 20-22. A large, dark brown, Jaeger-like bird with a rounded tail. With or without scattered lanceolate feathers of a dull golden hue down the back of the neck and upper shoulders. A conspicuous white bar at base of primaries (Figure 90).

Distinctions. As above.

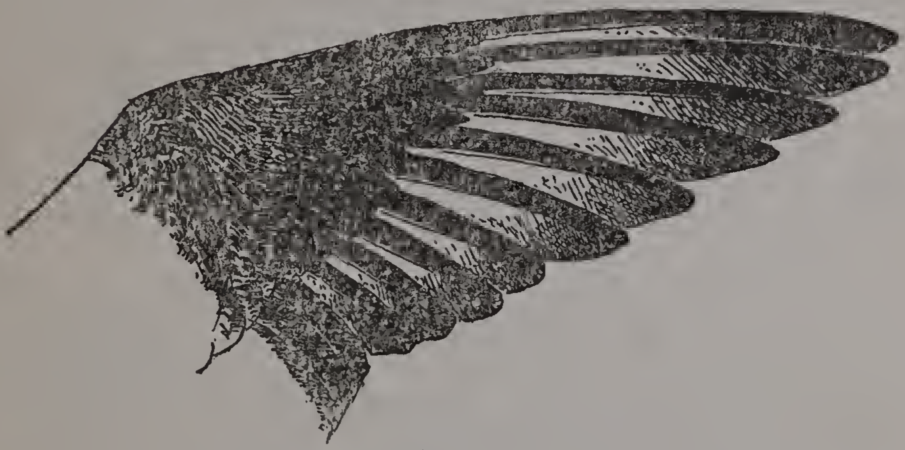


Figure 90

Wing of Jaeger, showing white at base of primaries; scale, about $\frac{1}{4}$.

Field Marks. Would probably be seen in life as a large, nearly black bird with round tail and conspicuous white spot at base of primaries. Disregarding the elongated tail feathers of the Jaegers, the Skua is considerably larger than any of them.

Distribution. Both shores of South America, wandering north in the Pacific occasionally. Breeds in the Fuegian Archipelago.

Nesting. Probably similar to the other members of the family.

A Skua taken off southern Vancouver island in 1917 was originally identified as the Atlantic Skua *Catharacta skua*, but has recently been assigned to this species. This is the only record of this bird in Canada. The Skuas are typically birds of the Antarctic where they occupy the same place in the natural economy as do our birds of prey. Too rare on our coast to be recorded except by specimens authoritatively identified.

36. **Pomarine Jaeger.** BOS'N. (BOATSWAIN) BIRD. *Stercorarius pomarinus.* L, 22 (Tail 9·25 maximum). Projection of centre tail feathers beyond outer ones 4·25 inches. Occurs in two phases and intermediate stages. In the dark phase, the general colour is dark brown, slightly lighter below and on cheeks, with a black cap. In light phase, the underparts, breast, neck, and face are white; cheeks mostly, and throat in some cases,

tinged with golden; the cap is black (Figure 89) and the rest of body dark brown. Dark barring may occur on flanks, breast, and underparts. Hardly distinguishable by colour from the two next Jaegers.

Distinctions. The largest of the three Jaegers. (Disregarding the long projecting tail feathers, 17·75 in length). A Jaeger with a wing over 13½ inches probably belongs to this species. The elongated tail feathers of the adult are wide, instead of pointed, and twisted at the tip so that the ends stand in a vertical plane instead of lying horizontally (Figure 91).

Field Marks. For recognition as a Jaeger see *Field Marks* under Family, page 48. The trailing, broad, twisted tail feathers are probably the best specific field marks.

Nesting. On the ground, on the moors and tundras of the north.

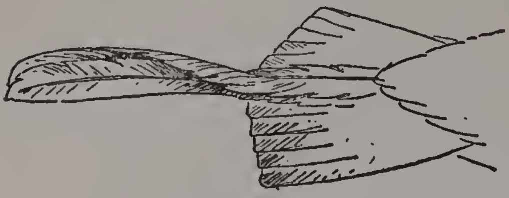


Figure 91
Tail of Pomarine Jaeger; scale about ⅕.

Distribution. Breeds on the islands and mainland of the Arctic, across the continent. Recorded from Great Slave and Athabaska lakes, but not elsewhere in the interior, except one record from Saskatchewan. A single migrant on the coast of British Columbia.

37. **Parasitic Jaeger.** ARCTIC OR RICHARDSON'S SKUA. *Stercorarius parasiticus.* L, 17 (Tail 8·25 maximum). (Projection of centre tail feathers 3·25). In coloration hardly distinguishable from the other two Jaegers (*See* preceding species for general description). Occurs in both phases there described and in various intermediate stages.

Distinctions. Decidedly smaller than the Pomarine, slightly larger than Long-tailed Jaegers. Length, disregarding elongated tail feathers, 13·75 instead of the 17·75 of the former or 13 of the latter. A Jaeger with a wing under 13 inches is probably either this or the next species. The elongated tail feathers of the adult are pointed and narrow instead of wide and twisted as in the Pomarine and but 3·25 inches projection beyond the rest, instead of 8 inches as in the Long-tailed (compare Figure 92 with 91 and 93). Immatures and birds with the centre tail feathers in moult are difficult to separate from the Long-tailed. The best distinction seems to be in the colour of the shafts of the primary feathers. In this species the shafts of the three first primaries (counting from outside) are white, the remainder darkening progressively as they succeed each other on the wing. In the Long-tailed there is an abrupt darkening of colour of the shafts with the third primary. This distinction is not infallible and occasional juvenile specimens are very difficult of determination.

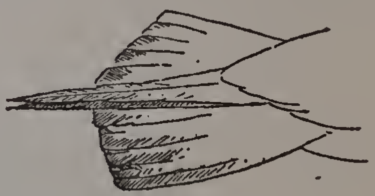


Figure 92
Tail of Parasitic Jaeger;
scale, about ⅕.

Field Marks. For recognition marks as a Jaeger *See* Family, *Field Marks,* page 48. The small projection of middle tail feathers and their not being broad and twisted probably make the best specific field marks.

Nesting. On the ground, on the moors and tundras of the north.

Distribution. Breeds in the Arctic across the continent. More common in migration on the sea-board than in the interior, but may occur anywhere in Canada. This is the Jaeger that is probably most likely to be met with in the Prairie Provinces and the commonest in migration on the British Columbia coast.

Juveniles have often been recorded as the Long-tailed and considerable caution should be used in identifying them.

38. **Long-tailed Jaeger.** MARLINE-SPIKE. BUFFON'S SKUA. *Stercorarius longicaudus.* L, 21 (Tail 13·25. Maximum projection of centre feathers 8). In coloration hardly distinguishable from the two preceding Jaegers. (*See* Pomarine Jaeger for general description.) Only the light phase certainly known to occur.

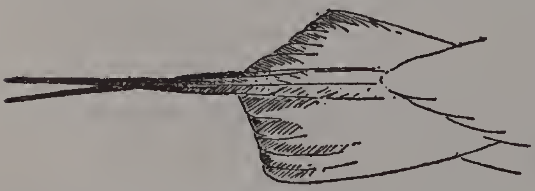


Figure 93
Tail of Long-tailed Jaeger; scale, about ⅕.

Distinctions. Decidedly smaller than the Pomarine, slightly smaller than the Parasitic. Length, disregarding greatly elongated tail feathers, 13 instead of 17·75 and 13·75 of the two former. A Jaeger with wing under 12 inches is probably this species. The very long tail feathers of the adult are narrow and attenuated instead of being broad and twisted as in the Pomarine and project 8 inches beyond the rest of the tail instead of 3·25 as in the Parasitic (Compare Figure 93 with 91 and 92). Immatures and birds with the centre tail feathers in moult are difficult to distinguish from the Parasitic. The best distinction seems to be in the colour of the shafts of the primary feathers. In this species the first two feather shafts (counting from the outside) are white, the remainder darken suddenly instead of gradually and progressively as on the Parasitic. This distinction may not be infallible and occasional juvenile specimens may occur that are very difficult of determination.

Field Marks. For recognition as Jaegers *See* Family *Field Marks*, page 48· The excessive projection of middle tail feathers and their being fine and attenuated instead of broad and twisted probably make the best specific field marks.

Nesting. On the ground, on the moors and tundras of the north.

Distribution. Breeds in the arctics of Europe, Asia, and America. Probably less common out of the far north than either of the other two.

Many old records of this species have proved to be Parasitics and the species should be identified with care.

FAMILY—LARIDAE. GULLS AND TERNS

General Description. The Gulls and Terns are Long-winged Swimmers, easily differentiated from the Jaegers by the shape and construction of the bill (Figure 94) which shows a single continuous surface without distinct parts or joints. The colours of the adult are usually pure white, with white or pearl-grey to black mantles, often with black wing-tips, hood, cape, or cheek spots.

Distinctions. Bill with continuous surface and sharp projecting angle on lower mandible is sufficient to diagnose the family in all plumages. Colours are quite characteristic, though some species during juvenility are uniformly dark, approaching the dark phases of the Jaegers.

Field Marks. Coloration and flight characteristics are the best field marks.

Nesting. Gulls generally build on ground, on rocky ledges or flat shores, in sandy, grassy, or marshy places; rarely, in trees.

Distribution. Gulls and Terns are distributed over all the world, usually near large bodies of water, but sometimes occurring far inland; for instance, in our prairie regions.

Subfamily—Larinae. Gulls

General Description. With the family description in mind the Gulls can be confused only with the Terns (*See* page 61).

Distinctions. May be distinguished from the Jaegers by the bill and coloration characters. (*See* previous family description, page 48); from the Terns, by their more robust build and mode of flight. Bills especially are heavier and stronger (Compare Figure 94 with 101 and 102). As a rule, tails are square. Distinctly forked in only one species, Sabine's Gull, *See* page 61. Though as much masters of flight as the Tern they have less agility and perform fewer aerial gymnastics. Young Gulls are often quite brownish and dark, in marked contrast with the adult. Young Terns are usually light in coloration.

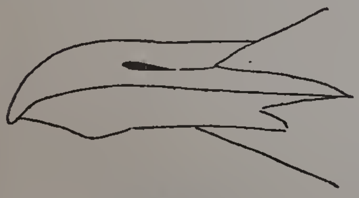


Figure 94
Typical bill outline of gull (Glaucous-winged); scale, ½.

There are two principal distinctly characteristic types of adult coloration amongst our Canadian Gulls: the Herring Gull type, large or medium-sized Gulls, white with bluish mantle, and the Bonaparte's Gull type, similar but smaller with black hood over whole head and neck. The species that do not fall into either of these categories are the Ivory Gull, entirely pure white, and Heerman's Gull, generally grey, lighter below, and with a nearly white head.

Field Marks. Large birds of heavier flight than the Terns. Square tails; surface feeding habits (Gulls rarely diving from the wing); and the horizontal carriage of the bill when flying are the best guides by which to distinguish the Gulls from the closely allied Terns.

Nesting. On rocky shores or cliffs near the water in various localities, depending upon the species and locality.

Distribution. Almost cosmopolitan in range and few countries are without representatives of the subfamily. In Canada about twenty-five species are known to occur.

Though Gulls are essentially sea birds they are at times found at considerable distances from large bodies of water and flocks often follow the prairie ploughman to search for insects in the newly turned furrows. They feed from the surface of the water, seldom diving, or glean from the shores, beaches, or fields.

Economic Status. Gulls eat any form of animal matter, fish, crustaceans, molluscs, insects, offal, and—when opportunity offers—young birds and mice.

The amount of fish they consume is relatively unimportant, as it is usually only very abundant small species occurring in great schools that attract their attention. They are not patient fishers like Herons, content to stalk their prey and take one fish at a time, but want them in abundance so that they can gulp them in quantities. They search low tidal shores for crabs and other shell-fish, showing considerable ingenuity in breaking the hard shells and extracting the contents, in many cases carrying them in the air and dropping them on the hard ground and rocks to shatter them. The food supply from these sources is economically insignificant. Gulls annually dispose of vast quantities of garbage and offal in the harbours and waterways and hence are beneficial scavengers. On the British Columbia coast they frequent the salmon rivers and gorge themselves on the spent and dying salmon. (The western salmon, unlike those of the east, after completing their mission of procreation die by thousands in the streams.) Undoubtedly at times some species destroy salmon eggs, but, as most of these are laid at the heads of streams rather than at the mouths where the greatest number of gulls congregate, their opportunity for serious damage is not great, except under exceptional circumstances or on short streams where the spawning grounds are within easy reach of the coast. Another charge against them is their egg-stealing proclivities when in the vicinity of rookeries of other species such as Murres and Cormorants, nor do they confine themselves to eggs alone, helpless unguarded young birds being equally welcome to them. It is apparent that when Gulls attack economically valuable species, objection may be taken to too great numbers of them, but their normal activities in this direction can as a rule be disregarded.

Gulls also frequent agricultural land for insect food. Indeed, some species are characteristic of the broad inland prairies. At times Gulls have been instrumental in stopping small mammal and grasshopper plagues and the Mormons of Utah have erected a monument to Gulls, that appeared at an opportune moment and destroyed the crickets that were ravaging the fields and producing famine. Gulls must be considered, therefore, as beneficial on the whole, and should be protected, although they do sometimes destroy eggs, young birds, and fish.

39. **Ivory Gull.** *Pagophila alba.* L, 16-19. Entirely pure white when adult. Juvenile with slight grey clouding in front of eyes, and sparse, sharply-defined, dark feather edges and flecks on the larger feathers.

Distinctions. The only absolutely pure white Gull with black legs. The young Glaucous Gull is not only a larger bird, but, though nearly white, is always slightly clouded with brownish ash, and with legs brown horn colour to flesh pink.

Field Marks. Too rare to be recorded on sight.

Distribution. The Arctic seas, more common on the east than the west coast. One specimen has been taken in Manitoba, near the big lakes, and other individuals in the Cassiar and Okanagan districts in British Columbia.

Too rare except in the far north to be further mentioned.

40. **Kittiwake** (Including **Pacific Kittiwake**). *Rissa tridactyla.* L, 16. A medium-sized Gull of the same general coloration as the Herring Gull (*See* page 54).

Distinctions. May always be know by the almost total absence, or rudimentary condition, of the hind toe (Figure 95). The tail is also slightly forked, the outer feathers being a quarter to half an inch longer than the centre ones.

Most like the Short-billed Gull in size and coloration, but has the black wing tips without subapical white spots. Dark brown or black legs and feet and evenly yellow bill will distinguish it from any other gull with which it might be confused.

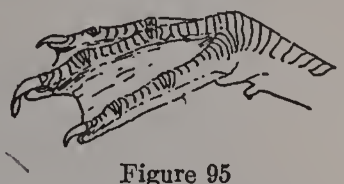


Figure 95
Foot of Kittiwake; scale, ½.

The juvenile Kittiwake, unlike juveniles of most other Gulls, is not brownish or clouded anywhere with any shade of ash. The white below is always pure and the mantle clear slaty. There is a dark aural spot, a heavy band of dark about the base of the hind neck, and another along the greater wing-coverts, making a bar across the base of the flight shafts. The tail has a subterminal bar.

Field Marks. The smallest of the Herring Gull type of coloration. The lack of white spot on wing tip, and dark legs are probably the best field marks. The tail is slightly forked when closed, and when fully spread is squarer than in other comparable species.

The species is rare in our waters and should be identified with caution.

Nesting. On shelves and ledges or perpendicular sea-cliffs.

Distribution. A strictly maritime species, not found in the interior. Inhabits both seacoasts, more common east than west. In the west, breeding south to Alaska peninsula and only a casual migrant to British Columbia. Occasionally recorded from Queen Charlotte islands and southern Vancouver island.

SUBSPECIES. The west coast form of the Kittiwake is the Pacific Kittiwake *Rissa tridactyla pollicaris*, separated from the eastern type form by slightly more distinctly formed hind toe, and claw, slightly less amount of black on primary tips, and rather larger size, and longer, more tapering bill. The distinctions, however, are slight and based on averages rather than individuals.

41. **Red-legged Kittiwake.** *Rissa brevirostris.* L, 15. A Kittiwake with darker mantle and coral-red legs, inhabiting the Alaskan coast of Bering sea, but which has not yet been recorded on the British Columbia coast. One record from Fortymile, Yukon Territory.

42. **Glaucous Gull.** BURGOMASTER. *Larus hyperboreus.* L, 28. The largest of our west coast Gulls. Of Herring Gull type of coloration, but mantle very pale and wing tips white. In the adult the mantle is only tinged with grey and younger specimens are nearly white, being only clouded with brownish or brownish cream. Birds of the year are slightly barred with ashy brown.

Distinctions. Large size, general whiteness, and brown to flesh-coloured legs.

Field Marks. Size, general coloration, and lack of black wing tips.

Distribution. The northern coasts from Newfoundland to Bering sea. Only an occasional winter visitor to British Columbia waters. Not as yet detected inland except, perhaps, as a straggler on the big lakes of Mackenzie region.

Nesting. On the ground, nest of seaweed or vegetable fragments.

SUBSPECIES. It has been proposed to separate the Glaucous Gull of the west coast from that of the east coast under the name Point Barrow Gull *Larus hyperboreus barrovianus*, on the basis of slightly smaller size. The form has not yet been recognized by the American Ornithologists' Union, but it may be the basis of the occasional reports of the Iceland Gull on the west coast of the continent.

44. **Glaucous-winged Gull.** *Larus glaucescens.* L, 25. Plate III A. A Herring Gull with grey instead of black wing tips. It is to be noted that the bird in the coloured plate shows the autumn or winter plumage with the crown and neck clouded with ashy.

Distinctions. The soft grey patterned wing tips are always distinctive of this species. Some juveniles and worn adults have practically white primaries and in this condition could easily be mistaken for Glaucous Gulls were the mantle lighter. Younger birds are difficult to distinguish from similar ages of Herring Gulls. In comparable plumages this species is constantly lighter in colour and the back is of finer and less decided pattern.

The tail and wing tip of the Herring Gull of the year are nearly black, but those of similar Glaucous-winged are decidedly mouse colour. In birds of this species assuming the adult blue mantle, the blue blends imperceptibly into the adjoining drab patches instead of forming piebald blotches.

It may best be known from other similar Gulls of the coast by size and the details given under those species. *See* Ring-billed and California Gulls.

Field Marks. Large size, grey wing tips or grey mantle and faded white wing tips. No characteristics can be given by which juveniles may be certainly recognized.

Nesting. On the ground or rock ledges; nest scanty, of seaweed or waste vegetable matter.

Distribution. Coast of north Pacific and Bering sea. Breeds from Washington northward.

This is the common summer Gull of the west coast. It throngs the harbours and waterways, from whence, during the salmon run, a few wander far up rivers. Not otherwise known far inland and not recorded from the prairies. Much that has been said of the Herring Gull applies to this species.

46. **Nelson's Gull.** *Larus nelsoni.* L, about 24. About the same size and general appearance as the Herring Gull, but with slightly paler mantle and the colour pattern of the primaries reduced to a few grey flecks, rather variable in detail, on a white ground. A large western variety of the eastern Kumlein's Gull. The only British Columbia record is a specimen from Vancouver island listed in the British Museum Catalogue of Birds. Only a few specimens have been taken and very little is known regarding it.

49. **Western Gull.** *Larus occidentalis.* L, 24. Like the Herring Gull, but with a very dark mantle, lead-colour rather than light slaty or pearl grey.

Distinctions. Dark, lead-coloured mantle, primaries black to base with only subapical white mirror. Juvenile birds seem almost identical with Herring Gulls of similar ages, but the browns are of a blacker and bluer shade.

Field Marks. Dark mantle, when adult, large amount of black with very little or no white to wing tips. The adult Herring and California Gulls, which are most likely to be mistaken for the Western Gull, have only the primary tips black.

Nesting. On ledges, crannies, grassy hillsides, and similar localities by the sea. Nest of grasses, etc.

Distribution. From Washington to lower California. Occasionally wandering north to Vancouver island.

Most of the references in literature to this species on the British Columbia coast refer to the Herring Gull. On investigation it has been found to be very rare, though perhaps of regular occurrence after the breeding season. More information is desired concerning this species in Canada. At present we have only two localities absolutely substantiated, Comox and Clayoquot on Vancouver island.

51. **Herring Gull** (Including **Thayer's Gull**). *Larus argentatus.* L, 24. Plate III B.

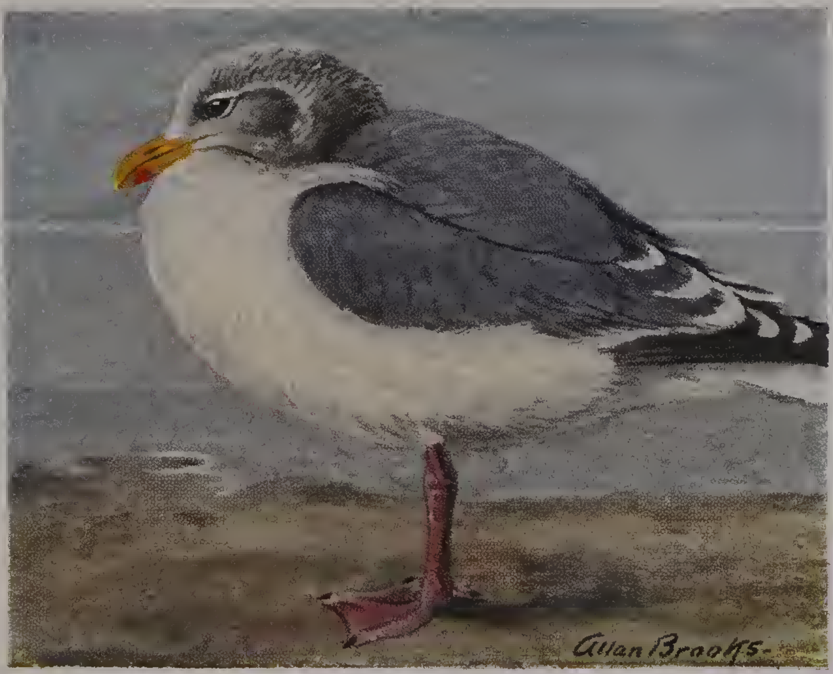
Distinctions. Several other Gulls so closely resemble this species, except for size and slight colour details, that considerable care must be used in identification. In autumn and winter, adult has head and neck flecked with ashy brown. Similar to Glaucous-winged Gull shown on Plate III A.

The typical adult differs from the Ring-billed in being larger, having flesh-coloured (light pink) feet instead of yellow, and a suffused red patch on the lower mandible without any dark spot on bill. Note, however, that in birds coming into maturity the remains of the black bill of juvenility often resemble that of a Ring-billed (*See* Figure 97).

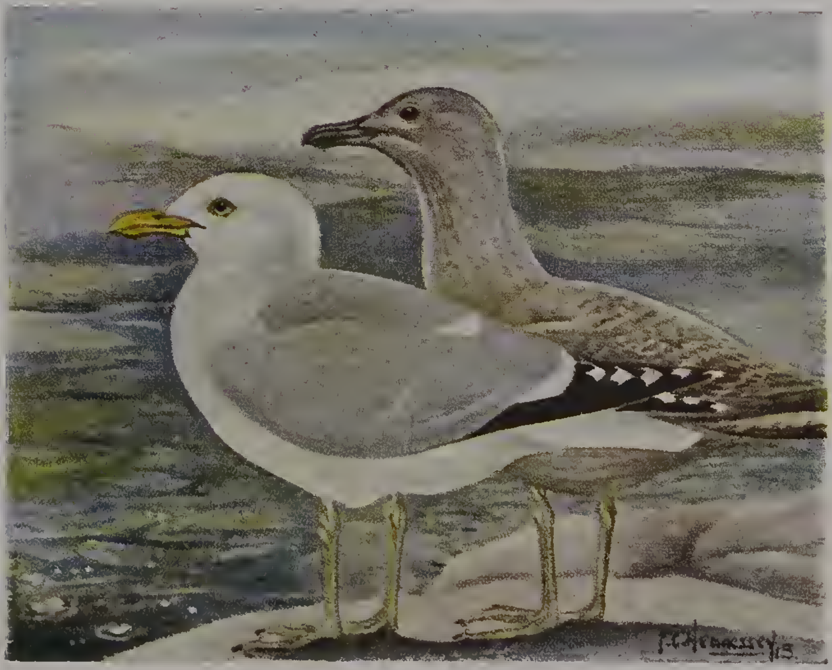
From the California it differs in being larger, feet flesh-coloured instead of pale greenish, and bill with no black fleck next to the red spot.

It may be distinguished from the Western by a lighter mantle, pearl grey instead of leaden, and less black on the wings.

Plate III


Allan Brooks.

A. Glaucous-winged Gull; scale, $\frac{1}{8}$
Adult in winter



B. Herring Gull; scale, $\frac{1}{9}$
Summer adult Juvenile

The juvenile Gulls are more difficult to distinguish and it will sometimes take the nicest discrimination to do so. The Herring Gull of the year is the darkest and most evenly sooty of any of the young Gulls it is likely to be confused with. The Western resembles it closely in colour, but is of a bluer cast, and is less even in tone. The Glaucous-winged is appreciably lighter, the darkest shade being mouse-coloured instead of nearly black. The California is considerably lighter, with more white mixed in above and below. The Ring-billed is still lighter, being more white than dark below, and shows indications of the pearly mantle even during the first autumn, and has a broad, suffused, dark terminal band instead of an all-dark tail. Between the dark, juvenile Herring Gull with brown legs and bill and nearly black tail and wings and the light-coloured adult with flesh coloured legs, red-spotted yellow bill, and black wing tips there is every gradation and it is only by careful attention to details that some of them can be separated. There is great individual and sex variation in size, and care must be taken in comparing this character that due allowance is made for these sources of confusion. The following schedule of characters of the Herring Gull may assist in the separation of these birds. Compare with similar schedule under other species. Large Gull about 24 inches.

Evenly very dark; tail evenly dark; bill dark with flesh-coloured base, feet brownish or flesh	First autumn
Light; slightly clouded with dark; tail clouded near end; bill yellowish, with partial or complete ring; feet flesh	Immature
Light; tail white; bill yellow with red spot; feet flesh. Eyelids and gape in western birds not coloured	Adult

Field Marks. Size and general colour. Similar to the Glaucous-winged and larger than the California or Ring-billed. The bill and feet colorations are often seen plainly enough for diagnosis. The very dark coloration of the juvenile of the year makes it easily distinguishable from the California or the Ring-billed and the lack of a sharply-defined tail band distinguishes it from any plumage of the latter.

Nesting. On the ground, on rocky ledges or the flat tops of isolated rocks, in nests of seaweed or vegetable matter.

Distribution. Across the continent, generally breeding north of our southern areas. Common on almost all the larger bodies of water, fresh or salt, at various seasons. Numbers of non-breeding birds summer far south of their nesting grounds. Common in winter on the west coast and occasionally so in summer, but we know of no regular breeding grounds in the immediate vicinity of the Pacific coast. In the central provinces the species breeds probably from the Arctics south to the edges of the prairies, though along the latter line the distribution is not well defined, for, in many cases, it has been confused in breeding season with the California Gull.

SUBSPECIES. A form, Thayer's Gull *Larus thayeri*, has been described from the eastern Arctics. It has been traced across the northern coast and down the Pacific shores of British Columbia where it occurs with more normally coloured types. It is doubtless only worthy of subspecific recognition. The breeding distribution of these two forms requires further investigation.

The Herring Gull is the large Gull of the interior and is common on the coast. It is a great wanderer and is often seen on the smallest of our lakes, even at a considerable distance from its nesting grounds. The Gulls that remain south of their normal nesting grounds through the summer are immatures or non-breeding birds. In winter the species remains upon the larger waters until they are frozen over and often throughout the entire season, beating over the open water or perched on the floating ice. The Gulls haunt harbours and congregate in large numbers about sewer outlets for the floating offal. They have also learned that ships are abundant providers of toothsome scraps. Fishing stations have great attractions for them and there is almost certain to be a large flock in attendance about the cleaning tables on the shore. At the seashore, shell-fish are eagerly sought for at low tide and the Gulls have learned the trick of carrying their hard-shelled prey into the air and dropping it upon the rocks, after which they descend and extract the savoury morsels from the broken case. In rough weather they congregate about foamy breakers off stormy points for the food that is brought to the surface. Occasionally they follow the immense schools of small fish that periodically visit our shores, and take toll of the inexhaustible supply.

Economic Status. It will be seen from the above summary of the Herring Gulls' food habits that as scavengers they are important and should be protected.

53. **California Gull.** *Larus californicus.* L, 20-23. Like a small Herring Gull, but with light yellow, greenish-yellow, or pale glaucous-green legs and feet, and a dark as well as a red spot near the end of the lower mandible (Figure 96).

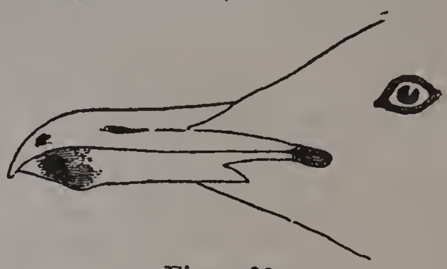


Figure 96
Bill of California Gull;
scale, ½.

Distinctions. In size between the Herring and the Ring-billed Gulls, but with sex and individual variation specimens may overlap either of these species in this character.

Distinguished from the Herring Gull in having a dark spot in the red of the lower mandible, red eyelids and gape, and having yellowish or greenish-yellow instead of flesh-coloured legs.

The Ring-billed is without red on the bill tips and has a dark spot on both mandibles, making a more or less complete ring about the bill (*See* Figure 97), and its feet are generally more strongly yellow.

The Short-billed Gull is the only other species with which the California Gull is likely to be confused. It is considerably smaller and has a plain greenish-yellow bill without either red or dark marks. The legs are almost similar in colour. Both Ring-billed and Short-billed may have red eyelids and gape like the California.

These birds are easily separated in maturity by the above characteristics. In juvenility the difficulties are greater. The following schedule may assist:

Medium-sized Gull, L, 20-23.
Quite dark; tail evenly dark; bill dark, with flesh-coloured base, feet brownish or flesh-coloured..........................First autumn
Light, speckled, or clouded; tail clouded towards end; bill yellowish with more or less dark ring; feet flesh or light greenish..Immature
Light; tail white; bill yellowish with red and black spot; feet light greenish, eyelids and gape red......................Adult

The juveniles are never as dark as first year Herring Gulls, but are darker than Ring-billed or Short-billed of similar ages. They never have a decided or clear-cut subterminal tail band as do the Ring-billed or the Short-billed, though the dark of immaturity lingers irregularly on the tail tip after the remainder has become pure white. Probably, in certain plumages, size of carefully sexed birds is the only means of separating them.

Field Marks. Size, smaller than a Herring Gull and larger than the Ring-billed, is generally suggestive. The red and black spot on the bill of the adult when seen is determinative. Yellowish or greenish legs distinguish it from the Herring Gull and the red on the bill from the Ring-billed.

In juvenility it is never as dark as the Herring Gull in the first year. Eye-sight records of some plumages are unreliable.

Nesting. On the ground, on low flat islands, as a rule marshy, or near the water.

Distribution. Western North America. Breeding in the interior in the Prairie Provinces (Saskatchewan and Alberta), north to the Arctic circle. Migrating to the Pacific coast of British Columbia southward.

Many of the records of the Herring Gull breeding in the prairie lakes apply to this species. Owing to the similarity of the two birds their occurrences have not been well delimited. This is probably the common large Gull breeding south of the Canadian National Railway tracks in Saskatchewan and Alberta. Its occurrence in Manitoba has yet to be recorded.

54. **Ring-billed Gull.** *Larus delawarensis.* L, 19·75. Similar to the Herring and California Gulls, but slightly smaller, and having a black ring about the bill near the tip (Figure 97) and with yellow legs and feet.

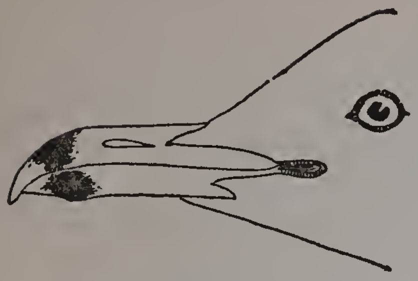


Figure 97
Bill of Ring-billed Gull;
scale, ½.

Distinctions. Smaller size, lack of red and the presence of dark ring on bill, and yellow legs, differentiate the Ring-bill from the Herring Gull.

From the California Gull, smaller size, in duly sexed specimens, and lack of red on the bill.

From the Short-billed Gull, larger size and presence of dark ring on bill.

In juvenility, distinctions are finer. The following schedule of characters may assist:

Medium-sized Gull. L, 19·75.

Comparatively light, much spotted; tail mottled, with extensive subterminal band; bill dark, with flesh-coloured base, feet dark or flesh-coloured	First autumn
Light; tail white with conspicuous band; bill yellowish with more or less ring; feet yellowish or flesh-coloured	Immature
Light; tail white; bill yellow or greenish yellow with dark ring; feet yellow; eyelids and gapes red	Adult

The Ring-billed Gull in first year is the lightest coloured of the larger Gulls, even at this time showing indications of the blue mantle on the back. Underparts nearly pure white, peppered with sparse, fine, dark bands. This and the sharp terminal tail bar will distinguish it from the Herring Gull and usually from the California. Size and general spottiness of the younger birds are probably the best criteria for separation from the Short-billed.

Field Marks. Size, decidedly smaller than the Herring Gull and slightly smaller than the California, larger than the Short-billed. The ring on the end of the bill is distinctive. Differentiated from the Herring Gull also by yellow instead of flesh-coloured legs.

In juvenility, the whitest of the young of the larger Gulls. Decidedly lighter than the dark Herring Gull of the first year and with a tail bar that is never present in that species. More spotty than similarly juvenile California or Short-billed Gulls. Eye-sight records in juvenility are not very reliable in localities where the two latter species may be expected.

Nesting. On the ground, on rocky, stony, or marshy shores.

Distribution. Across the continent, breeding over most of eastern and central Canada north to Great Slave lake. No records of breeding in British Columbia, but probably does so in the northern interior. Common on the coast in migration.

This is probably the commonest of the large Gulls throughout the interior, and the one most often seen on or about the lakes and sloughs of the prairie region.

55. **Short-billed Gull.** AMERICAN MEW GULL. *Larus brachyrhynchus.* L, 17·50. Similar in coloration to the Herring Gull, but the smallest of this type of coloration.

Distinctions. Its clear yellow bill without dark or red spot or ring, is distinctive from all others except the Kittiwake. Its feet and legs are yellowish or yellowish green similar to its two larger relatives. Likely to be confused only with the Ring-billed or perhaps the California. When juvenile it may at times be difficult to distinguish from either of these. The following schedule may assist:

Small Gull, L, 17·50.

Evenly dark; tail evenly dark; bill dark, flesh-coloured at base; feet brownish or flesh-coloured	First autumn
Light, clouded and speckled; tail white with subterminal bar; bill dark or dark greenish; feet light greenish	Immature
Light; tail white; bill yellow; feet yellowish green; eyelids brown, gape red	Adult

Field Marks. The smallest of the common Gulls of Herring Gull type of coloration. Bill without dark or red spot or ring. Field separation of juveniles except by size is somewhat unreliable.

Nesting. On the ground on stony, rocky, or marshy shores of freshwater lakes.

Distribution. Western North America. Breeding in northern Alberta and Saskatchewan, north throughout the Mackenzie and Yukon basins and the interior of Alaska. Migrates to the Pacific coast, wintering from the south end of Vancouver island southward. Not recorded from the southern parts of the Prairie Provinces.

SUBSPECIES. This is the American representative of the Old World Mew Gull *Larus canus* and has been proposed as a subspecies, *Larus canus brachyrhynchus.*

The migration route of this species is most interesting, being one that is followed by several other species. Breeding in the centre of the great northern land mass of Mackenzie region, it migrates to the west coast, crossing the mountains in the north and not regularly coming south into settled country en route, though occasionally seen on the interior lakes of British Columbia.

57. **Heermann's Gull.** WHITE-HEADED GULL. *Larus heermanni.* L, 17·50-20. A distinctively coloured Gull. Adult in summer: grey, darker to plumbeous above, lighter to ashy below, with black wings and tail, and white head usually slightly speckled when seen in our waters. Bill, bright red. Adults in autumn: have heads heavily marked or speckled with brown, the head above darker than neck, chin and throat white. Juveniles are uniform dark brown, chin in some cases whitish.

Distinctions. Well characterized as above.

Field Marks. A Grey Gull with light or white head, red bill, and black feet.

Nesting. On the ground amidst rocks and stones on level spots of lonely rocks and islets.

Distribution. Breeding along the shores of Lower California, migrating in autumn and winter northward to Vancouver island.

A bird of anomalous habits and the only species of Gull breeding in the northern hemisphere and migrating northward as far as Canada in winter. A few, probably sub-adult, are to be seen on the Vancouver Island shores in summer.

59. **Franklin's Gull.** PRAIRIE PIGEON. *Larus franklini.* L, 14. Plate IV A.

Practically identical with Bonaparte's Gull from which it differs only in detail.

Distinctions. To be seriously confused only with Bonaparte's Gull, but may be distinguished by its slightly darker mantle and the small amount of white on the wings (wrists and most of the primaries being slate grey instead of pure white) (Figure 98, compare with Figure 99). The bill and feet vary, with age and season, from black to maroon. In Bonaparte's Gull the bill is always black and the feet vary from flesh-coloured to coral red. In both species, the rosy suffusion of the underparts is evanescent and not always present in specimens, as it quickly fades to white after death and exposure to light. The juvenile can best be distinguished by the wing pattern in which the primaries are solid black in the bird of the year instead of with large white areas.

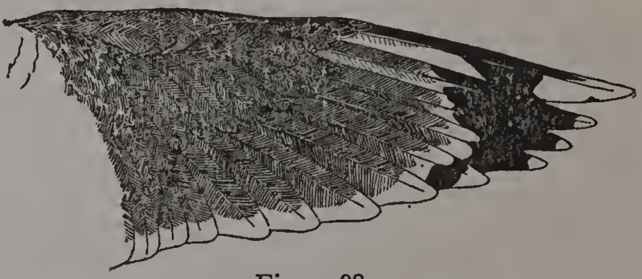


Figure 98

Wing of Franklin's Gull; scale, ¼.

Field Marks. The blackness of the wings without prominent white wrists makes the best field marks for all plumages. The black or deep maroon legs and the dull red bill also assist in recognition. Either Franklin's or Bonaparte's Gull may be known from the Terns which they may resemble in life by the decided wing pattern instead of the even pale greyness of those species.

Nesting. Nest of dead rushes and debris in wet marshes adjoining prairie lakes and sloughs.

Distribution. The interior, from Manitoba to Alberta. Not known to breed north of the prairie sections and not recorded from British Columbia.

This is a characteristic Gull of the prairies. Nesting in large colonies in the marshy sloughs and lakes, these Gulls appear in clouds of thousands of individuals and follow the heavy gang ploughs in flocks that almost hide the driver and team from view.

They settle on the freshly turned black earth, packing into their eager crops the grubs, worms, and larvæ that are scurrying to new shelter after the upheaval. One surface quickly exhausted, they rise to air again, beat over their companions still busily at work, whirl once or twice about the ploughman so closely that he might cut them down with his whip, and settle on freshly turned clods again, to repeat the operation over and over. Thus it goes from daylight to dark and the destruction carried into the insect ranks on these fields preparing for cultivation is enormous and well appreciated by the husbandman. Later in the season when the green, half-grown grain waves in the wind, there is a constant procession from the breeding sloughs out over the farmland. Beating across the soft green fields, a flock of a hundred or more will pause, hover a moment, and then drop into them, sinking from sight—one, a few, or many at a time, in a little spot that makes the onlooker wonder that so many can find shelter and concealment in so small a space; but the sea of grain closes over them so that no sign is visible of the eager activity below. Presently a black wing is raised, a white body flashes in the sun; others follow, and for a moment there is a white outboiling that presently resolves itself into the flock, wing-borne to again circle away over the many-acred field and repeat the performance. At times a number of such aggregations can be seen at once over a single field. The attraction is generally grasshoppers and the number of these insects that a few hundred Gulls can devour on a long summer day, and day by day throughout the season, is an important factor in insect control.

Again, in the evening, they may mount the upper air over or near lake shores and, high up, gleaming like jewels in the last rays of the setting sun while the ground below perhaps is lost in blue evening shadows, they weave intricate aerial patterns in pursuit of the "lake flies" that blow in smoke-like clouds about them.

In the autumn, they often unite with flocks of Bonaparte's Gull, forming incredible numbers, and drive up and down over the harvest fields, rising on whistling wings to pass over obstructions and again descending to barely a man's height from the ground as they gather the insects from the air. What species forms their special pursuit at this time has not been definitely ascertained, but undoubtedly the great majority of their tiny prey are better placed in the crops of hordes of Gulls than peaceably permitted to prepare for next season's crops.

Economic Status. On the whole, the western farmer probably has no more efficient friend than this little Gull of tireless wing, and the indignation of the community should be experienced by those who disturb their nesting or interfere with their security. In many localities, a swamp where these Gulls breed is worth far more as insect insurance to the surrounding community than if it were drained and its small acreage brought under cultivation. A few hundred acres are an inappreciable addition to the sum total of productive land and may at times be bought at too high a price. Consideration should be given to this factor sometimes before the last bits of reclamation are undertaken.

60. **Bonaparte's Gull.** *Larus philadelphia.* L, 14. Plate IV A.

Distinctions. Likely to be confused only with Franklin's Gull and with it only in the Prairie Provinces. It can be distinguished from that species by its slightly lighter mantle and large amount of white on the wings (wrists and most of the primaries pure white instead of slate grey) (Figure 99, compare with Figure 98). The bill is black in all ages instead of maroon and the feet vary with age and season from flesh-coloured to coral red instead of from black to dull maroon. In both species the rosy suffusion of the underparts is evanescent and not always present, quickly fading to white after death and exposure to light. The juvenile can best be distinguished by the wing pattern in which the primaries contain large white areas and the wrist is almost all white.

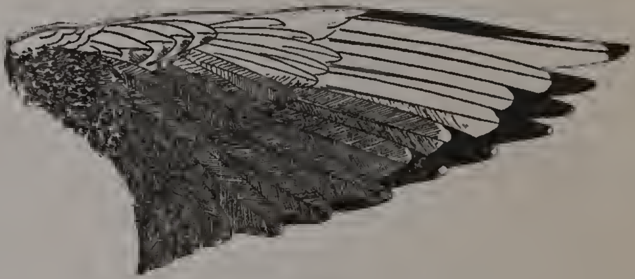


Figure 99
Wing of Bonaparte's Gull; scale, ¼.

Field Marks. The whiteness of the wings, and prominent white wrists make the best field mark for all plumages. The coral legs and black bill also assist in recognition. Either this or Franklin's Gull can be distinguished from the Terns, which they may resemble in life, by the decided wing pattern instead of the pale, even greyness of those species.

Nesting. Almost unknown. Said to nest in trees at times, a wide departure from custom in this class of birds.

Distribution. Across the continent during migration. The only nests reported have been in the far northwest and the interior of Alaska. In migration common throughout all parts of southern Canada.

Economic Status. Much that has been said of Franklin's Gull might be repeated here as it often joins flocks of that species and has very similar habits, though it does not spend as much time in cultivated sections.

61. **Ross's Gull.** ROSS'S ROSY GULL. WEDGE-TAILED GULL. *Rhodostethia rosea.* L, 14. (Projection of centre tail feather, 1). A pale-mantled Gull with white head, and fine black collar line. Tail wedge-shaped, graduated from long centre feather.

Distinctions. The above description of adult is unlike any other bird it is likely to be compared with. The juvenile resembles, in general, parallel plumages of the black-headed Gulls. The secondaries and secondary coverts of Ross's Gull are largely white, showing even more white than Sabine's Gull, and the tail is wedge-shaped instead of forked.

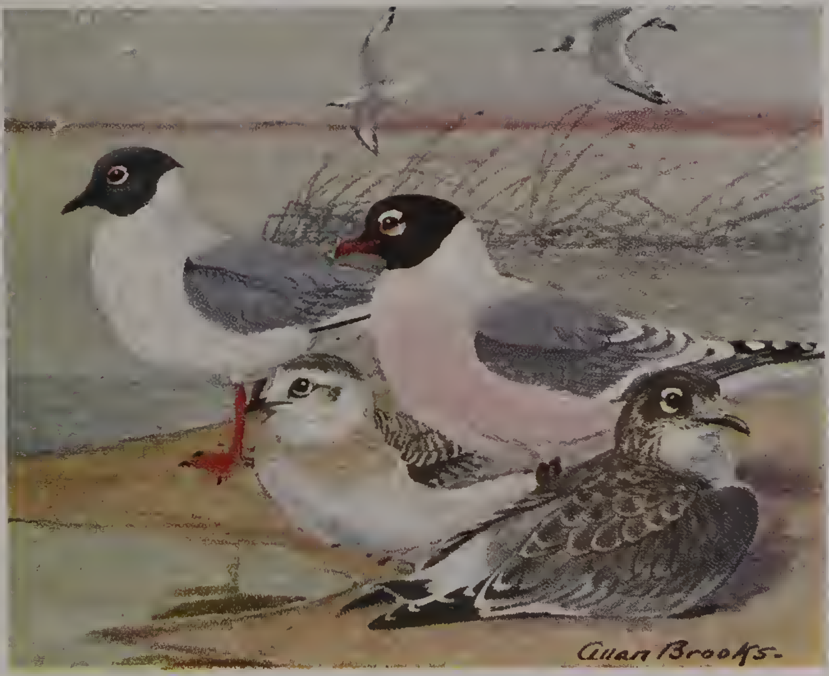
Field Marks. A small white-headed Gull with large amount of white in wings and a wedge-shaped tail.

Nesting. On the ground, near tundra lakes and ponds.

Distribution. The high Arctic regions, nearly circumpolar. Reported to breed in northeastern Asia and Greenland, but not reported as doing so north of American continent.

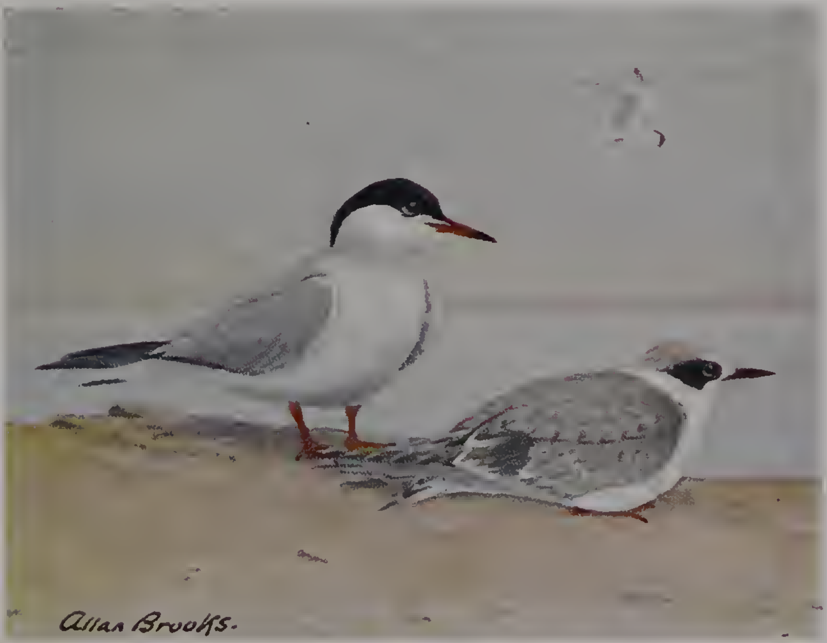
This species is one of the very rarest of the Gulls and has not been recorded south of Norton sound, Alaska. Within Canadian limits we have only a few scattered records from the Arctic islands. It is not to be expected elsewhere in Canada.

PLATE IV


Allan Brooks.

A. Bonaparte's Gull; scale, $\frac{1}{6}$
Adult in winter (flying)
Summer adult
Juvenile

Franklin's Gull; scale, $\frac{1}{6}$
Adult in winter (flying)
Summer adult
Juvenile


Allan Brooks.

B. Forster's Tern; scale, $\frac{1}{6}$
Summer adult Juvenile

62. **Sabine's Gull.** *Xema sabini.* L, 13·50. Similar to Franklin's or Bonaparte's Gull, especially the latter, but smaller and with wings almost black, with a dark slate-grey hood bordered basally by a black line making a narrow ring around the upper neck, cutting sharply against a white, lower neck (Figure 100).

Distinctions. Like a small Franklin's Gull, but with a grey, black-bordered hood instead of a black one. Black legs and feet and black bill tipped with yellow. Tail forked, outer feathers about 1¼ inches longer than middle ones (Figure 100).

Juvenile darker and more evenly sooty above than either Franklin's or Bonaparte's Gulls. Tail forked. In all plumages the wings seem characteristic, the primaries and wrist are almost solid black, the secondaries very largely solid white.

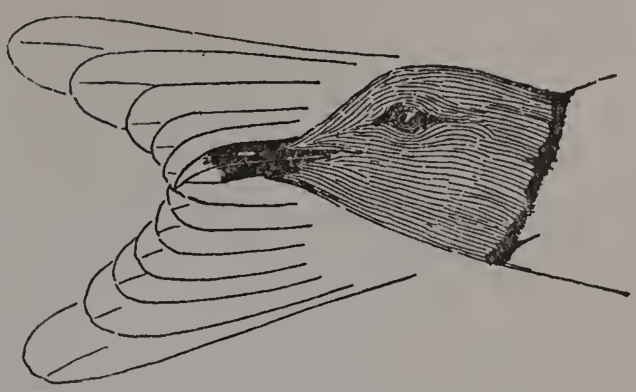


Figure 100
Specific details of Sabine's Gull; scale, ⅓.

Field Marks. Should be an easy bird to recognize in life, a small dark-hooded Gull with forked tail. Intensely black primaries and wrist contrasted with a great white area of secondaries. It is, however, too rare, except in the far north, to be accepted as a record on field observations alone.

Nesting. Usually on the moss of the boggy edges of tundra pools.

Distribution. The Arctic regions, only occasionally wandering down into southern sections. We have stray records for northern Manitoba, northern Saskatchewan, and southern British Columbia.

One of the most delicately beautiful of the Gulls, but too rare to receive more than passing mention.

Subfamily—Sterninae. Terns

General Description. The Terns, or Sea Swallows as they are sometimes called, are smaller, lighter, and of more graceful build and habit than the Gulls.

Distinctions. The bill—lighter, and more slender than that of the Gulls (*See* bill, Figures 101 and 102 compared with 94 to 100)—and the forked tail are characteristic of the Terns and will usually separate them without difficulty. All Canadian species have a more or less forked tail and all but one (the Black Tern) in summer adult plumage have a sharply-defined black cap. The forking of the tails of young birds, though beginning to show early in their development, does not reach its maximum until after they leave for the winter; hence, through the summer and autumn, many individuals will be seen with much smaller forks than the above measurements indicate.

Field Marks. The greater lightness of action on the wing and constant and rapid aerial evolution; the fact that Terns constantly dive from the wing, and the habit of commonly turning the bill straight down towards the water instead of carrying it on a line with the body, are characteristic. The forked tails and black caps are also good recognition marks for adults.

Nesting. Whereas Gulls seem to prefer rocky shores upon which to breed, the Terns, except Forster's and the Black, favour sandy beaches, laying their eggs in a smooth circle of pebbles without other nest preparation.

Distribution. As a subfamily, Terns are more southerly in distribution than Gulls, though at least one species, the Arctic Tern, has been found as far north as land occurs. All our species migrate, none remaining in eastern Canada during the winter.

One has only to watch a flock of Terns feeding to recognize the appropriateness of the popular term Sea Swallow. Their active grace and dainty, pearl-like colours are a joy to the nature lover. Terns are, on the whole, less marine in their habits than Gulls and are not so often seen far from land. They haunt harbours, shores, and beaches, and live largely upon small fish caught near the surface by quick, sudden dives from the wing, but they are not scavengers. In these dives the birds plunge in head first with a splash of white spray in which for a moment they disappear, but they never go far under water.

64. **Caspian Tern** (Including **American Caspian Tern**). *Sterna caspia.* L, 21 (Forking of tail 1·50[1]). The largest of our Canadian Terns. In colour very similar to the Common Tern (*See* page 63 and Plate V A).

Distinctions. Large size of this Tern is characteristic. The Caspian Tern is as large as some of the smaller Gulls; but its bill, though comparatively heavy for a Tern, is too graceful and tapering to be gull-like.

Field Marks. Rather distinctively marked in life. In size, it is more likely to be compared with a Ring-billed Gull than a Tern, but its big red bill, black cap, slightly forked tail, and general tern-like coloration are plain. The slow beat of its long wings is different from the more quickly moving small Tern and its voice is raucous; a single hoarse monosyllable that may be rendered *"Casp"* is characteristic.

Nesting. On sandy beaches, or rocky or gravelly islands.

Distribution. A nearly cosmopolitan species. Found in the Old as well as the New World. Occurs rather irregularly all over Canada, but its known nesting stations are few and scattered over the continent from Great Slave lake to Labrador.

SUBSPECIES. The American Caspian Tern has been lately separated from that of the Old World under the name of *Sterna caspia imperator.*

We have breeding records for this species on lake Winnipeg and Great Slave lake and occasional sight records down through the Prairie Provinces and southern British Columbia.

Economic Status. Though probably a fish feeder and the largest of its subfamily the Caspian Tern is too scarce and its food is too small to have any appreciable economic influence.

A particularly beautiful and interesting bird. Its wide range, scattered breeding stations, and growing scarcity suggest that the numbers we see today are the remnants of a once much more numerous and generally distributed race and that if we are to have it with us in the future special care should be taken to guard its local nesting communities from molestation.

69. **Forster's Tern.** *Sterna forsteri.* L, 15 (Forking of tail 4·1). Plate IV B.

Distinctions. Forster's Tern so nearly resembles both the Common and the Arctic Tern as to require close attention to small details to differentiate it from them. The most determinative characteristic by which it may be separated from any other species is the coloration of the long outer tail feathers, which are shaded with dark on the inner instead of the outer web (Figure 101). The underparts are also pure white instead of being delicately shaded wth pearly grey. In juvenility and autumn or winter plumages, the face markings are quite characteristic. In Forster's Tern the dark face patch is sharply defined and does not overspread the nape to meet its fellow from the other side (compare with Figure 102). In juvenile and winter plumages the bill is largely or completely black.

Field Marks. In mixed flocks of Common and Forster's Terns the latter can sometimes be distinguished by the superior silvery-whiteness of the underparts. The juvenile and autumn plumages are separable by the face mark being confined to the cheeks and not spreading across the back of the neck to make a dark nape band.

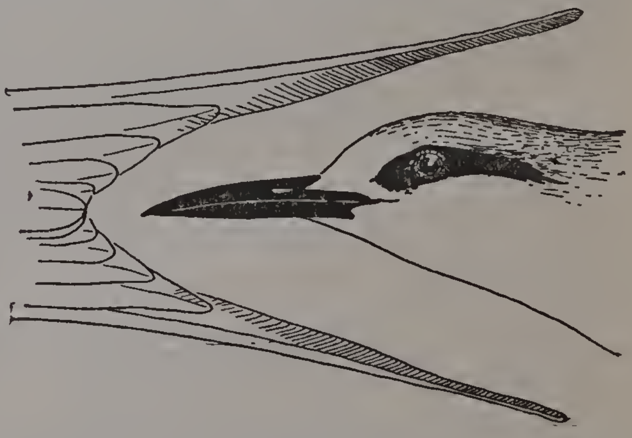


Figure 101
Specific details of Forster's Tern; tail and head of juvenile or winter plumage; scale, ½.

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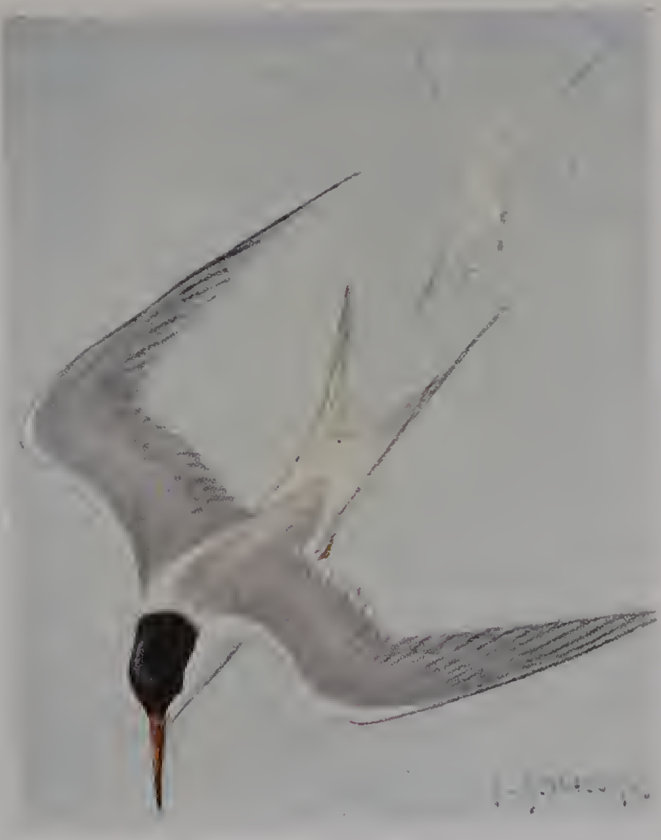
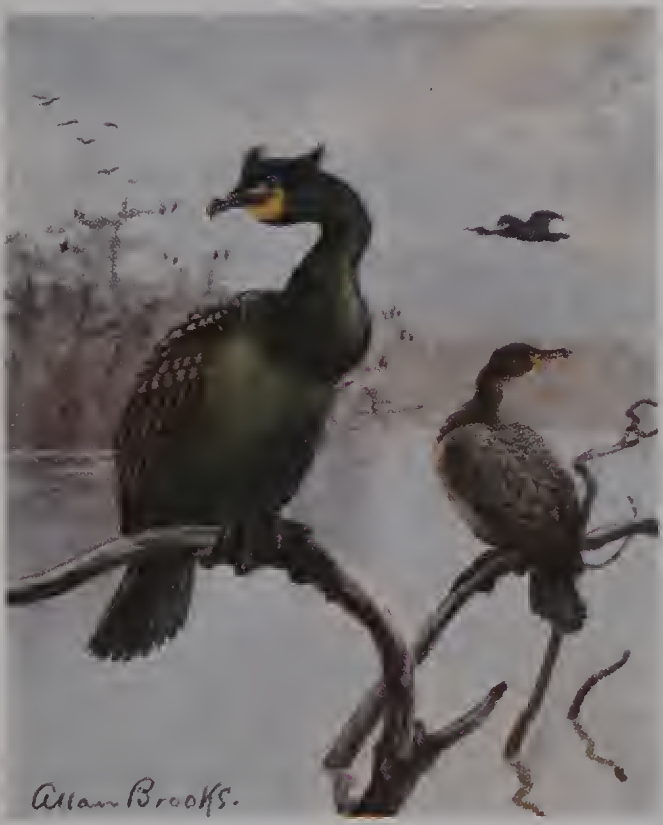
[1] This measurement shows the difference in length between the middle and outer tail feathers. A great part of the total length of these birds is in the greatly elongated outer tail feathers and these do not reach their maximum in juvenile birds. Hence this figure is given to correct the often times greatly misleading nature of the usual length measurement.

Plate V



A. Common Tern; scale, $\frac{1}{4}$
Summer adult


Allan Brooks.

B. Double-crested Cormorant; scale, $\frac{1}{8}$
Spring adult Juvenile

The best criterion of the species in any plumage, however, is its call note which is very different from that of the Common. Instead of a sharp *"Tearrrr"* it is a woodeny and lower pitched *"Churrrr."* When this difference is once heard and marked it affords the most reliable field guide that can be given.

Nesting. On slight elevations in grassy marshes, in nests built of waste vegetation.

Distribution. A bird of the prairie interior, probably nesting in any suitable places wherever found in Canada. Not yet reported from British Columbia, although there are records from the state of Washington.

These Terns frequent marshes rather than beaches and do not seem to gather in such large flocks on the big lakes as do the Common Tern to which they are otherwise very similar in habit. Though common throughout the eastern prairie sections they are more local and less generally distributed than the Common Tern.

70. **Common Tern.** WILSON'S TERN. *Sterna hirundo.* L, 15 (Forking of tail 3·1). Plate V A.

Distinctions. The Common Tern resembles both the Arctic and Forster's Terns so nearly as to require close attention to small details to separate it from them. The certain characteristic by which it can be separated from Forster's, but not the Arctic, is the coloration of the long outer tail feathers which are shaded with dark on the outer instead of the inner web (Figure 102). The underparts in the adult are also delicately shaded with pearly grey, averaging appreciably lighter than the Arctic but slightly darker than Forster's. This distinction does not always hold with juvenile birds. In young or autumn plumages, the face markings are quite distinct from those of Forster's, but not from the Arctic. In the Common Tern, the dark face patch suffuses across the nape of the neck to meet its fellow from the opposite side, making a continuous nape band (compare with Figure 101). In juvenility the bill is largely flesh-coloured and black, and in the autumn adult much of the redness is lost. From the Arctic Tern distinction is rather more difficult. The grey below does not average quite as deep, but this characteristic is not common to all individuals. The forward third of bill of the adult Common Tern is black, but the bill of the Arctic is red to the tip. The only distinction from that species that holds in all plumages is that of the feet and legs. Those of the Arctic Tern are particularly small, the tarsus being not more than 0·65 inch in length; that of the Common Tern is not less than 0·8 inch.

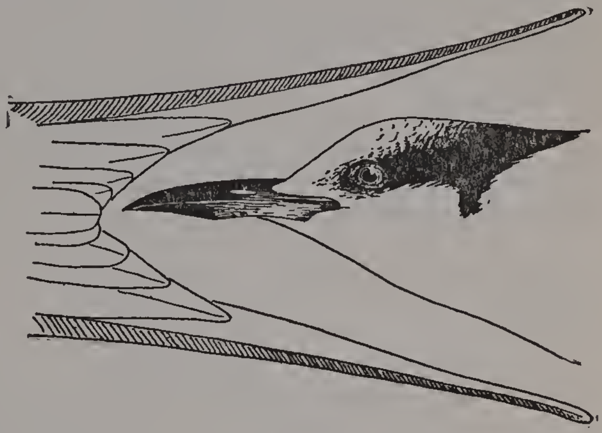


Figure 102
Specific details of Common Tern; tail and head of juvenile or winter plumage; scale, ½.

Field Marks. In mixed flocks of Common and Forster's Terns the Common can sometimes be distinguished by the slightly greyish clouding of the white underparts. In autumn and juvenility it can be separated from Forster's by the face mark spreading over the back of the head. The best field distinction between the two species, however, is the call note which is very different from that of Forster's, which is a sharp *"Tearrr"* instead of a duller and more woodeny-sounding *"Churrr."* From the Arctic Tern differentiation is more difficult. The black-tipped instead of all red bill may be made out under favourable circumstances. When on the ground the Common Tern stands up higher on its legs than the Arctic Tern. The latter hugs the ground with its body as it walks, and has a mouse-like glide. The Common Tern is likely to be confused with Forster's only in the interior, and with the Arctic only on the Pacific coast.

Nesting. On sandy or gravelly bars. Eggs laid directly on the ground.

Distribution. Across the continent, breeding north to the Arctic. This is the most abundant Tern in the prairie interior and in British Columbia.

Common, especially in the interior about sandy shores, scarcer on rocky ones. The Common Tern may be seen on most of our larger bodies of water, salt or fresh, throughout the summer. Its wonderful lightness of wing, and graceful circlings—one instant hovering on rapidly beating wings, stationary in the air, as it searches for some tid-bit below, and the next dropping like a plummet with a sparkling splash—are constant delights to a seeker of the beautiful. Its shrill cry, harsh in itself, blends harmoniously with the soft surge of the surf and remains in keeping with marine surroundings.

Economic Status. Though fairly numerous in suitable localities this species is too small to be seriously destructive.

71. **Arctic Tern.** *Sterna paradisaea.* L, 15·50 (Forking of tail 4·50). Closely resembling the Common and Forster's Terns (*See* Plates IV B and V A) in size and colour.

Distinctions. The Arctic Tern has a little deeper greyish suffusion over breast and underparts than the Common Tern. Bill is red to tip, and feet and legs are very small and weak. It is not likely to be confused with Forster's on account of difference in range. In its colour characteristics it resembles the Common Tern very closely.

Field Marks. An all red bill and little short legs, that make it look when standing as if crouching directly on the ground, and when walking it moves with a mouse-like glide.

Distribution. The Arctic regions, south in the interior to the big lakes of Mackenzie region, and southern Alaska. It has been taken along the latter coast as far as the Canadian line, but rarely in British Columbia waters. We have records from the northern interior of that province, but none from anywhere east of the mountains.

The remarks made under the Common Tern will apply to this species. It is remarkable that it has not been observed more often in our southern latitudes, for the species makes one of the longest migrations known. Summering north as far as land occurs, it winters as far south as the Antarctic continent. How it journeys there from the northwest coast without being noted en route is one of the interesting problems of American ornithology.

77. **Black Tern.** *Chlidonias nigra.* L, 10 (Forking of tail 0·8). The smallest of our common Terns, dark slate-grey, deepening to dull black on head, neck, and underparts.

Distinctions. The above description is sufficient to separate summer adults. Winter and immature birds have a dirty white face, throat, neck ring, and underparts, and the grey above is suffused with more or less brown. It is, however, always considerably darker than corresponding plumages of other species. This fact, and the small size of the bird, should be sufficient to differentiate it at all times. Immature plumages retained throughout the following summer have been the basis of occasional records for the White-winged Black Tern, which will have to be removed from the Canadian list.

Field Marks. Size and coloration make this species easy to recognize in life.

Nesting. On slight elevations such as old muskrat houses or floating debris in wet marshes, nest of vegetable matter.

Distribution. The American Black Tern is a bird of the interior, breeding from the Great Lakes region westward, north as far as Great Slave lake in the interior, and in southern British Columbia.

SUBSPECIES. The Black Tern occurs in both Europe and America in allied subspecific forms of which the European is the type. The American Black Tern *C.n. surinamensis* is the subspecies with which we are concerned.

This is a bird characteristic of the inland marshes, only rarely seen on the larger bodies of water, and throughout the interior prairies no extensive expanse of watery marsh is without it. Its general habits are much like those of the other Terns. It is less common in British Columbia than east of the mountains.

Economic Status. The insect content of this bird's food is probably larger than that of the other Terns. In the south it is known to consume the larvæ of the cotton-boll weevil and it follows the ploughman of the west for the grubs turned up. Therefore, we may venture to state that it is probably actively beneficial. At any rate the fish it takes, if any, are mud-inhabiting forms of small economic importance.

Order—Tubinares. Tube-nosed Swimmers

General Description. Tireless fliers of the deep sea, of various sizes from the large Albatross to the small Petrel. Usually dull and evenly coloured birds, but some strikingly black and white.

Distinctions. Nostrils are encased in tubes on top or on sides of the bill proper (Figures 103-107).

Field Marks. General flight habits and coloration.

Familiarity with the various species is necessary to recognize members of the order.

Nesting. On the ground or in burrows in out-of-the-way localities, often on rocky islets far out at sea to which they find their way in some mysterious manner that we cannot explain.

Distribution. As a family, they are birds of the southern hemisphere, for it is there that they reach their fullest development in numbers of individuals and species. However, some inhabit the north far into the Arctics.

The Tube-nosed Swimmers are essentially marine, using the land only for breeding purposes. The ocean is their home and its lonely waste is sufficient for all their needs except that of rearing their young. They, therefore, as a class, rarely come into shallow water and are most commonly seen by the deep-water sailor, the offshore fisherman, or the ocean voyager. There are two families of the order: the Albatrosses, *Diomedeidae;* and the Fulmars, Shearwaters, and Petrels, *Hydrobatidae;* that are here called for convenience the Greater and Lesser Tube-nosed Swimmers owing to their comparative sizes.

Economic Status. Owing to their pelagic habitat they are of little if any known economic interest.

FAMILY—DIOMEDEIDAE. THE GREATER TUBE-NOSED SWIMMERS. ALBATROSSES

General Description. Tube-nosed Swimmers (*See* previous description) 30 to 36 inches long with an extent of 10 feet or more. Nostrils in independent tubes, one on each side of the culmen and not united or rising above it as in next family (Figures 103, 104, compare with 105-107).

Distinctions. Decidedly larger than any of the Lesser Tube-noses. Bill built up of large plates with well-defined divisions. Nostrils as above.

Field Marks. Great size and immensely long wings.

Nesting. On the ground, usually in large communities on lonely oceanic islands.

Distribution. The family is most characteristic of the southern hemisphere but wanders all over the deep seas.

The Albatrosses are true pelagics and seldom come to land except to nest. Even along our outer seashores they are rarely seen, as they prefer the wide expanse of the trackless deep rather than coastal waters. The deep-sea fisherman sees them far out from land and the transoceanic traveller glimpses them in mid-ocean. Very rarely is one taken along the shores and there are few birds about which we know less. The untiring flight of the Albatross is proverbial. Sailing for hours in the wind, seemingly without apparent motion of wing or expenditure of exertion, they are the wonder and admiration of aviators. The manner in which they find their way in proper season, without guide or landmark, to the small specks of ocean islands across the trackless water, is truly marvellous and suggests the possession of special powers of orientation. The mystery and interest that surround these birds is well expressed in Coleridge's poem

"The Ancient Mariner" and the bird is still looked upon with a certain awe and superstition by old-time sailors.

Albatrosses come too seldom in contact with man or his works to have any economic importance except as victims of one of the most iniquitous branches of the millinery trade. It was long the practice for plume-hunting ships to fill their holds with the commercial fragments of their skins at the islands where they nested in countless thousands. This trade was often accompanied by the most horrible unnecessary cruelty. On one occasion, hundreds were confined on Laysan island until they starved to death that their skins might be the freer of oil and grease. The immense number of the birds in nesting localities and the degree of destruction that the trade entailed are well shown by the fact that poachers, disturbed in their work, left behind them on the same island a large shed piled to the roof with wing tips alone.

Fortunately, however, certain countries such as Canada, Great Britain, and the United States have forbidden, with certain exceptions, the importation of millinery feathers and so have destroyed the greatest markets for the trade and done much to discourage it.

These tireless fliers are great wanderers and although only three species have actually been recognized on our west coast, almost any may occasionally occur. Specimens should be carefully examined, as any one of them may represent species new to the Canadian or even the American list.

81. **Black-footed Albatross.** GONY. *Diomedea nigripes.* L, 32. An almost black Albatross, slightly lighter about face, with black legs and feet and dark bill.

Distinctions. The bill plate covering the culmen widening back of nostrils and meeting the plates on sides of the mandible (Figure 103, compare with 104). This feature separates our two most common Albatrosses, the Black-footed and Short-tailed, from the rarer Yellow-nosed. Plumage, feet, legs, and bill are always dusky or black. The feet and bill of the similarly plumaged Short-tailed are light.

Field Marks. A dark Albatross with dark bill, legs, and feet.

Distribution. North Pacific. Breeding on the Hawaiian and Marshall islands.

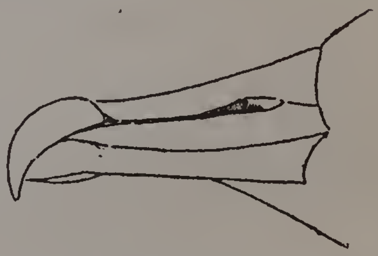


Figure 103
Bill of Black-footed Albatross; scale, ½.

This is probably the Albatross of most frequent occurrence on the British Columbia coast. There are a number of records from the south end of Vancouver island and up along the Alaskan coast.

82. **Short-tailed Albatross.** *Diomedea albatrus.* L, 33-37. Adult: a white Albatross with wings and tail largely dusky. Bill, legs, and feet light. Juvenile: sooty brown like the Black-footed, but with light bill, legs, and feet.

Distinctions. Plate on culmen widening back to nostrils (similar to Figure 103) distinguishes this and the preceding species from the Yellow-nosed. Adult: mostly white with tail largely dusky, and without the decided dark mantle and wings of the Yellow-nosed. Juvenile: dark like the Black-footed Albatross, but bill, legs, and feet pale.

Field Marks. A white Albatross with dusky wings and tail, but without a decided black mantle or, in juvenility, a dark one with light coloured legs, feet, and bill.

Distribution. North Pacific ocean, breeding on Wake, Laysan, and Bonin islands.

This species has been taken near Victoria, and on the Alaskan coast of Bering sea.

83. **Yellow-nosed Albatross.** *Thalassogeron culminatus.* L, 36. A white Albatross with dark mantle and wings, pale legs and feet, and a yellow culmen.

Distinctions. Plate on culmen narrow, not widening behind nostrils to meet the plates of the sides of the mandible (Figure 104, compare with 103) separates this from the previously mentioned and more common Albatrosses. Head and neck greyish, shading into a decided dark, cinnamon brown mantle and wings.

Field Marks. A white Albatross with greyish head and neck and a cinnamon brown mantle and wings.

Distribution. South Pacific, South Atlantic, and Indian oceans.

Once taken near the mouth of Columbia river and once in gulf of St. Lawrence. No actual British Columbia records, but should be looked for because of its nearby occurrence.

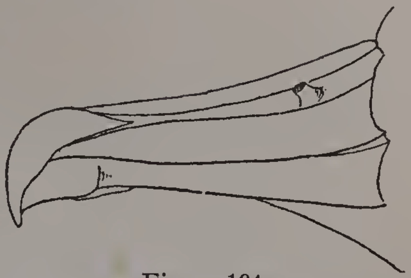


Figure 104

Bill of Yellow-nosed Albatross; scale, $\frac{1}{3}$.

FAMILY—HYDROBATIDAE. LESSER TUBE-NOSED SWIMMERS. FULMARS, SHEARWATERS, AND PETRELS

General Description. See previous description of order.

Distinctions. Lesser Tube-nosed Swimmers are smaller than the Albatrosses. Nostril tubes on top of bill, fused together or separate (Figures 105-107).

Field Marks. General coloration and flight habits. Wings stiffly held straight out from the body and long, steady glides on motionless wings (Fulmars and Shearwaters), or gently flitting close to the surface up one side of a wave and down the other, with feet occasionally paddling along as if running on the surface (Petrels).

Distribution. The family is distributed over the oceans of the world from pole to pole. Though many species are regularly confined to the southern hemisphere they are great wanderers and the list of stragglers on our northern coast is comparatively large. Of many species very little is known, and our knowledge of several of them is confined to single, or a few, specimens, that have found their way into collectors' hands. Other species than those here listed may be eventually found on our coasts, but their identification should be made with the greatest caution.

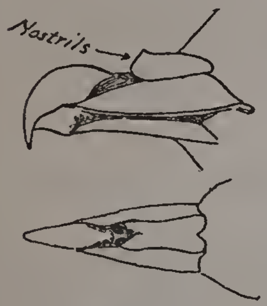


Figure 105

Bill of Fulmar; scale, $\frac{1}{2}$.

Economic Status. Though feeding almost entirely on fish and offal, their deep sea habitat renders these birds of little economic importance.

Subfamily—Fulmarinae. Fulmars

General Description. Among the larger of the Lesser Tube-nosed Swimmers. Smoky grey, or white with pale grey mantle, like a Gull.

Distinctions. Bill comparatively short and stout, heavily built. Nostrils in tubes closely fused together and, in the single species so far noted on our British Columbia coast, extending almost to the base of the terminal hook (Figure 105, compare with 106 and 107).

Field Marks. *See* species, following.

86. **Fulmar** (Including **Pacific Fulmar**). *Fulmarus glacialis.* L, 19. A large bird of gull-like coloration (light phase), or evenly dark, slaty grey (dark phase), and tube-encased nostrils (Figure 105).

Distinctions. One of the larger of the Lesser Tube-noses, even grey, or white and grey gull-like coloration.

Field Marks. Flight habits, stiffly-held outstretched wings, and long glides, together with light or grey coloration instead of dark brown as in the Shearwaters, which approach the Fulmars in size, should usually render this species recognizable in life.

Nesting. In large communities on ledges of rocky cliffs.

Distribution. The Fulmar is a bird of the north, breeding in high latitudes and migrating to our southern coasts.

SUBSPECIES. Occurring on both Atlantic and Pacific coasts of our continent in different subspecific forms. The west coast form is the Pacific Fulmar *Fulmarus glacialis glupischa.* More often seen by sealers and whalers, the offal of whose trade attracts numbers of Fulmars. They are often seen by travellers in mid-ocean or off shore.

Economic Status. Of no economic importance.

Extralimital. The Slender-billed Fulmar, Priocella antarctica

One taken in 1840 "A day's sail from mouth of Columbia river." It may at any time occur on our coast. It is similar to the Pacific Fulmar, but with shorter nasal tubes and with tubes and tip of bill black instead of light yellowish with rest of bill.

Subfamily—Puffininae. Shearwaters and Petrels

General Description. Tube-nosed swimmers, 8 to 20 inches long. Even, sooty brown, or dark above and white below; one of the smaller species (Forked-tailed Petrel) ashy-coloured.

Distinctions. Our species fall into two groups. (a) Shearwaters, large, with bill considerably longer than that of the Fulmar (Figure 106, compare with Figure 105). (b) Petrels, small, with bill very similar to the Fulmar's in outline, but much smaller. *See* headings Shearwater and Petrels (pages 68 and 69).

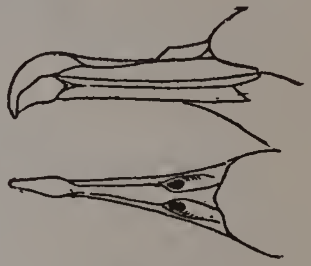


Figure 106
Bill of Sooty Shearwater; scale, ½.

Shearwaters

General Description. Large birds, 17 to 20 inches long. Solid dark brown coloration, or dark above and white below.

Distinction. Bill stout. Nostril tubes not closely fused, but on either side of culmen, with space between as wide as, or wider than, nostril (Figure 106).

Field Marks. Large size, solid dark coloration, or dark above and white below. The square or rounded tail and flight habits will distinguish it from the hawk-like Jaegers with long, graduated tail, which may be similar in size or colour. Colour should separate it from the Fulmar which has similar size and flight. The long, narrow wings, held stiffly at right angles to the body, the rapid wing-strokes alternating with long glides, often of half a mile or more, are characteristics of these birds and the Fulmar.

Nesting. Little is known of the nesting of the Shearwaters. Mostly in holes in the ground or crevices among rocks on isolated islets in the south seas. Migrate north in our summer.

91. **Pink-footed Shearwater.** *Puffinus creatopus.* L, 19. Dark brownish grey, to nearly black above, white below from vent to throat.

Distinctions. Colour readily separates it from the dark-coloured Shearwaters.

Field Marks. Extensive white colour below, larger than the Black-vented Shearwater.

Distribution. The western Pacific, south to Chile, breeding on Juan Fernandez island.

This Shearwater has been taken at Forrester island, just north of the British Columbia boundary on the coast, and at sea off the southern end of Vancouver island. It is probably of only casual occurrence in Canadian waters. It should be identified with considerable caution.

93. **Black-vented Shearwater.** *Puffinus opisthomelas.* L, 12. Practically a smaller form of the Pink-footed Shearwater. Upper parts sooty grey to nearly black, lighter on head and neck, white below.

Distinctions. To be confused only with Pink-footed Shearwater, but is a smaller bird and with greater contrast between upper and lower surfaces.

Field Marks. Extensive white below. Smaller than the Pink-footed.

Distribution. Pacific ocean, breeding off coast of Lower California and Mexico.

Has been taken off the south end of Vancouver island, but is apparently only a straggler so far north. Neither of these white-underbodied Shearwaters is likely to be seen.

95. **Sooty Shearwater.** *Puffinus griseus.* L, 16-18. All dark brownish grey. Lining of wings nearly white.

Distinctions. Rather browner and less greyish, underwing coverts whiter, and a larger bird than the Slender-billed Shearwater, the only Shearwater it is likely to be confused with (bill, Figure 106).

Field Marks. A dark Shearwater with considerable white along the forward edge of underwing. Larger than the Slender-billed.

Distribution. Oceans of southern hemisphere. Breeds among the islands of Tierra del Fuego. In summer, north to Canadian waters on both coasts, in the west to the base of the Alaska Panhandle.

This is the commonest of the Shearwaters to be seen on our British Columbia coast.

96. **Slender-billed Shearwater.** *Puffinus tenuirostris.* L, 14. May be regarded as a smaller form of the Sooty Shearwater.

Distinctions. Smaller and rather greyer than the Sooty Shearwater and with grey rather than white underwing coverts. The name Slender-billed is rather misleading. The bill is if anything shorter and relatively stouter than the preceding species (Figure 106).

Field Marks. A dark Shearwater, light grey along the forward edge of the underwing. Smaller than the Sooty Shearwater.

Distribution. Southern hemisphere north in summer to Bering sea.

Our records for this species cover southern Vancouver island and the north end of Queen Charlotte islands. May be commoner than our records indicate as on sight it may be confused with the Sooty.

Petrels

General Description. In our waters represented by small birds about 8 inches long. Evenly sooty brown with white rump; or ash-grey in colour.

Distinctions. Small size. Nostril tubes closely fused so that the division between is reduced to a narrow septum (Figure 107). Tail slightly to decidedly forked.

Field Marks. Small, evenly-coloured birds flitting close to the surface of the water at sea, pattering up and down the waves as if walking on them.

Nesting. In burrows in the ground or under rocks.

The birds are well known to sailors and travellers under the name of "Mother Carey's Chickens" and their appearance is said to presage a storm. In spite of their diminutive size they are met with far out at sea and are seldom seen by the longshoreman except in the vicinity of their breeding grounds. Even where they nest in numbers, they may remain unnoticed by the ordinary observer, owing to their nocturnal habits when breeding.

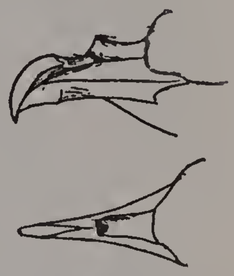


Figure 107
Bill of Leach's Petrel; natural size.

Economic Status. The Petrels though feeding on fish are too small and live too far from civilization to be of measurable economic importance.

105. **Fork-tailed Petrel.** *Oceanodroma furcata.* L, 8-9. An ashy grey Petrel, lighter below and on throat. Tail decidedly forked, outer feathers nearly an inch longer than the centre ones.

Distinctions. Ashy grey coloration instead of smoky brown.

Field Marks. The ashy colour and lack of white rump patch.

Distribution. North Pacific and adjacent Arctic oceans. Breeds along the Pacific coast south to Oregon. Our only substantiated breeding records are from Queen Charlotte islands, but it is recorded as nesting both to the north and the south of our shores.

106. **Leach's Petrel** (Including **Kaeding's** and **Beal's Petrels**). *Oceanodroma leucorhoa.* L, 8. A small, sooty-brown Petrel, very slightly paler below, with a white rump. Tail slightly forked, outer feathers three-quarters of an inch longer than centre ones.

Distinctions. Sooty-brown coloration instead of ashy grey as the Fork-tailed Petrel.

Field Marks. Sooty-brown coloration and white rump.

Distribution. North Pacific and north Atlantic oceans. In the former breeding south to Lower California. Our only ascertained breeding locality for this species in British Columbia is on Queen Charlotte islands, though one is reported from cape Flattery in Washington.

SUBSPECIES. The American Ornithologists' Union Committee recognizes two divisions of this species, regarding the representatives from Washington southward as a distinct subspecies, Kaeding's Petrel *Oceanodroma kaedingi.* Some refer Alaska birds to *Oceanodroma leucorhoa leucorhoa,* Lower California specimens to *Oceanodroma leucorhoa kaedingi,* and introduce a third form *Oceanodroma leucorhoa beali* for Washington, Oregon, and California. Whether or not the lack of breeding records between Queen Charlotte islands and cape Flattery is a real hiatus in distribution is uncertain. At least it is questionable which race should be ascribed to the Canadian coast. In a subject so open to dispute, discussion is unprofitable without more material and study.

Order—Steganopodes. Totipalmate Swimmers. Full-webbed Swimmers

General Description. Birds with webs between all four toes, making three webs instead of the usual two as in other orders (Figure 6, page 24).

Distinctions. The feet characters are always distinctive.

West Canadian *Totipalmates* are represented by two families: *Phalacrocoracidae,* the Cormorants; and *Pelecanidae,* the Pelicans.

Economic Status. This order, being composed of large birds, all fish-eaters, and many of them frequenting inshore or inland waters in considerable numbers, is open to a certain amount of suspicion as to its economic effect. However, no step should be taken against any species until careful investigation has proved its necessity.

FAMILY—PHALACROCORACIDAE. CORMORANTS

General Description. Large birds 25 to 36 inches, black or very dark brown in colour. Bill, long and slender, abruptly and strongly hooked at tip. No external nostrils. Skin around eyes bare, and usually a small unfeathered gular or throat pouch (Figures 108-110). Highest mating plumages have variously shaped crests and filamentous plumes, but these ornaments are retained for only a short time (sometimes suppressed [?]) and are often absent.

Distinctions. The general form and outline of the bill are superficially similar to those of the Jaegers or the Shearwaters, but are fundamentally quite different. The lack of external nostrils, the bare space about eyes, and bare gular pouch easily distinguish the Cormorants from them. These bare spots are usually highly coloured. In some specimens of the Pelagic Cormorant the bare gular pouch is small and may be largely overgrown with feathers.

Field Marks. Flying, the long outstretched head and neck, long tail, rapidly beating wings, and direct flight of this family are easily recognized. On the water Cormorants look something like Loons, but the motions of the head and neck are more graceful and serpentine and the long tail when shown is distinctive.

Distribution. Cosmopolitan, but naturally confined to the vicinity of large bodies of water. We have one species in the interior of the continent and three on the west coast.

Cormorants are fish-eaters and capture their prey by straight pursuit under water. With extraordinary ease they secure their agile prey in its own element. As seen in clear water or a tank, their subaquatic movements seem unhurried, yet such is the economy of effort that they take speedy fish with absurd ease. They never dive from the wing, but first alight and then disappear below with a serpentine gliding motion without splash. They seldom remain under more than forty seconds, though it seems longer to the observer. They bring their prey to the surface for swallowing, often with it crosswise in the bill, then deftly toss it in the air and unerringly catch it so that it goes down easily head first without danger from fins and spines.

Though Cormorants are thoroughly aquatic, their plumage does not seem to be so well adapted for such habits as that of other water birds and it appears necessary for them to come ashore at intervals to dry their feathers. Then they love to sit in the warm sun on crags, rocks, or isolated perches such as buoys, which in the neighbourhood of their operations are always liberally whitened with their guano. There, with wings hanging flaccidly, and a general air of dejection, they drape themselves with all the grace of a wet rag.

Economic Status. The danger of jumping at conclusions based upon superficial observation or common report is well illustrated by the result of a study of the food of these birds in the neighbourhood of the Gaspe salmon rivers.[1] Though commonly accused of damaging the salmon fisheries by devouring small fish and fry, careful examination of about thirty specimens showed that the birds were eating fish of no economic value and no salmonoid remains were found in them. Probably the eels, sculpins, and other fish taken by the Cormorant make the species beneficial rather than harmful to the salmon, and may more than compensate for the few valuable fish that it occasionally takes. This provides a good example of the caution that is necessary in condemning any species of birds.

120. **Double-crested Cormorant** (Including **White-crested Cormorant**). CROW DUCK. *Phalacrocorax auritus.* L, 36. Plate V B. A large Cormorant. Adult: solid black, with greenish reflections. Feathers on back dull bronze with black edges, giving suggestion of overlapping scales. Bare face, and gular pouch, orange. Crest when present, double, one over each ear, of filamentous plumes. Juvenile: dark sooty brown, lightening below, the scaly appearance of back evident.

Distinctions. Size similar to Brandt's Cormorant, much larger than Pelagic. Black edgings to dull bronze back feathers evident in all plumages. Lower line of gular pouch cut square across throat not indented to heart-shape (Figure 108, compare with 109 and 110). No distinct lightening of plumage around gular pouch.

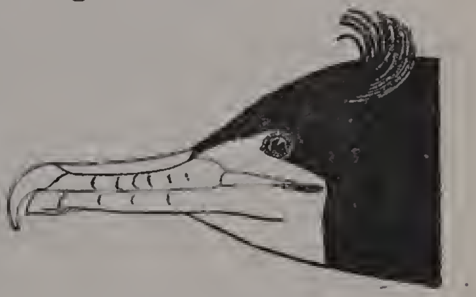


Figure 108
Double-crested Cormorant; scale, $\frac{1}{3}$.

Field Marks. Size, and yellow face and sides of bill should distinguish from Pelagic. Black or evenly-coloured featheration about base of gular pouch, when seen, will separate it from Brandt's.

Nesting. In bulky nests, among rocks on islands, cliffs, or other almost inaccessible localities. Occasionally in trees.

Distribution. North America. Common and nesting locally throughout the Prairie Provinces north to Great Slave lake. Common on the Pacific coast, but almost absent from the interior of British Columbia. Known to nest at cape Flattery, and Forrester island, just across the border to the north, but not proved to breed within British Columbia.

SUBSPECIES. The bird of the coast is separable from that of the prairie interior by somewhat larger size and the presence of considerable white in the crest, hence the name, White-crested Cormorant *Phalacrocorax auritus cincinatus.*

This is the common Cormorant, or Crow Duck, of the prairies and great central lakes. It nests on bare islands on the larger bodies of water, sometimes in immense communities, or in company with Pelicans, Gulls, or Herons. In British Columbia it is confined to the coast, where it seems more or less of a migrant, or a winter visitor. Although it has been found nesting directly north and south of the Canadian coast we have no breeding records for British Columbia. Colonies should be looked for on the outer shore of Vancouver island.

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[1] "The Double-crested Cormorant, Phalacrocorax auritus, and its Relation to Salmon Industries on the Gulf St. Lawrence," Dept. of Mines, Geol. Surv., Can., Mus. Bull. No. 13, Biological Series No. 5, 1915.

These Cormorants often fish in companies. They spread themselves across the mouth of a shallow bay, and, facing inward, make a drive in towards a common centre. As they advance, the enclosed area becomes smaller and more closely guarded, the finny population more congested and easily caught. The divings grow shorter and more rapid and more fish are tossed and swallowed in hurried haste for another catch. As the shore is approached, the surviving fish make a despairing rush outward through their enemies, and there is much commotion and excitement; then quietness, and the birds form line again along another section of the water to repeat the operation.

Economic Status. See the heading under family. Much said under the Pelican applies here with even greater force, owing to the smaller size of the birds and consequent smaller capacity for harm.

122. **Brandt's Cormorant.** *Phalacrocorax penicillatus.* L, 35. About the same size as the Double-crested, and considerably larger than the Pelagic. Adult: black, iridescent with green and blue. A fawn-coloured patch about the blue gular pouch, blending into the surrounding black. No crests, but in highest plumage, with sparse, long, yellowish filaments on sides of neck and throat.

Distinctions. Size, similar to Double-crested, and much larger than Pelagic. No dark edgings to feathers of back. Lower edge of bare gular pouch intruded by throat feathering, making its outline heart-shaped (Figure 109). A light fawn patch about the base of gular pouch, conspicuous in adult, evident as a soft yet distinct lightening in the juveniles.

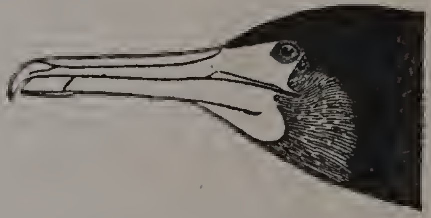

Figure 109
Brandt's Cormorant;
scale, ⅓.

Field Marks. Size, and absence of yellow on bill or gular pouch. The light fore-throat should be quite conspicuous in birds approaching maturity.

Nesting. On rounded shoulders or ledges, or flat tops of rock islands, or similar localities.

Distribution. Pacific coast, from south end of the Alaska Panhandle to Lower California. Breeding from the west coast of Vancouver island (Solander island) southward.

123. **Pelagic Cormorant** (Including **Violet-green** and **Baird's Cormorants**). *Phalacrocorax pelagicus.* L, about 25. The smallest of our Cormorants. Adult: black, with beautiful purple and green reflections. Bare face and gular pouch dull carmine red. Bare gular pouch very small for the family, heart-shaped by the intrusion of a point of throat feathering, in some cases completely obliterated. In highest plumage, with two crests, one over forehead, the other on rear crown (Figure 110). Iridescent purple neck thickly sprinkled with loose, white filaments. A conspicuous white patch on lower flank. These crests, filaments, and body patches may be entirely absent in otherwise high plumaged specimens. Juvenile: even, sooty brown, with very little lightening anywhere.

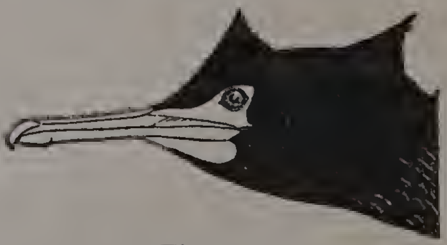

Figure 110
Pelagic Cormorant;
scale, ⅓.

Distinctions. Small size, even coloration, with large amount of iridescence that is suggested on the back in even juvenile plumages.

Field Marks. Small size, colour unrelieved by light face patch or yellow bill or gular pouch. The two crests and white flank spots when present.

Nesting. On cliff, sea-wall ledges, and similar situations.

Distribution. Coasts of north Pacific, breeding south to California. Breeding colonies have been noted at the south end of Vancouver island and on Queen Charlotte islands.

This is the most beautiful of the American Cormorants, and in summer at least the commonest one on our western coast. Unfortunately few of the Cormorants keep their plumage ornaments for any length of time and their greatest beauty is seldom seen.

SUBSPECIES. The American Ornithologists' Union Check-list divides the Pelagic Cormorant into three subspecies: *Phalacrocorax pelagicus pelagicus* restricted to the Asiatic shores; *P. p. robustus*, the Violet-green Cormorant, occupying the Alaskan coast and south to Washington; and *P. p. resplendens*, Baird's Cormorant, from Washington southward. The differences are mostly of size, the middle one, *robustus*, being assumed the largest and the other two of about equal size. Recent authors, however, do not recognize *robustus* as a separate subspecies. Our British Columbia birds have hitherto been referred to *robustus*, but the measurements of the series in the Victoria Memorial Museum, even those from Queen Charlotte islands, place them unmistakably with *resplendens*. There is certainly much to be learned from the study of specimens of these birds and the delimitation of the races of this species is uncertain.

FAMILY—PELICANIDAE. THE PELICANS

Among the very largest of American birds, with very long, flattened bill, and enormous throat patch.

In Canada, only two species need be considered, both strongly characterized. One is very common on the prairies; the other is met with only on the coast and there but rarely.

125. **White Pelican.** *Pelecanus erythrorhynchos.* L, about 64. Pure white, with black wings, long flattened bill (12 inches or over), and an enormous yellow gular pouch capable of holding several quarts (Figure 111). On the top and midway the length of the bill there is in some cases an extraordinary horny plate irregular in outline, but erect like a rifle sight and up to an inch and a half in height. This ornament is deciduous and is shed annually. It is common to both sexes, and not the particular property of the male as is generally stated. Juveniles have more or less clouding of brown on nape and hind head.

Distinctions. The above are absolutely distinctive.

Field Marks. A great white bird with black wings and large yellow throat pouch that can be seen almost as far as the bird itself. The only other white birds that approximate to the Pelican in size are the Swans and the Whooping Crane. The Swans have all white wings, and the Crane very long legs, and in flight carry legs and neck outstretched, instead of hunching the head up on the shoulders as do the Pelicans.

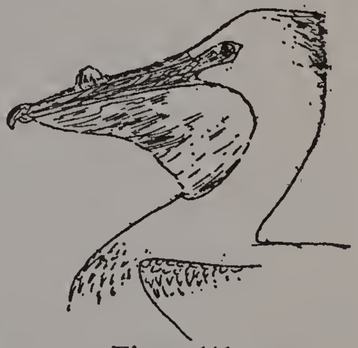

Figure 111
White Pelican; scale, about $\frac{1}{18}$.

Nesting. On the ground, usually on bare or stony islands in the larger lakes.

Distribution. Most of temperate North America, breeding in Canada, across the prairies and north to near Great Slave lake. Rare east of the Prairie Provinces or in British Columbia.

The ponderously serious flight of these great white birds with their slow beat, beat, beat, and then a long dignified sail, is a common sight near the larger prairie waters, as they wing back and forth between the lakes and feeding grounds. They fly in long, evenly-spaced lines, abreast, in tandem, or in V's. Pelicans are communists, individualism is unknown among them. The way one faces, they all face; as one poses, they all pose. Standing on a bare sandbar, they line up in military formation and digest their dinners together. Flying, they assume their appointed positions, and, taking their beat from their leader, keep time with him, flapping and sailing together. No more beautiful sight may be seen on the prairies than a long line of these great white birds, black pinioned, with golden pouches tucked under their chins, all sparkling in the bright sunlight in brilliant contrast with the deep blue water or azure sky. The realization of how well these seemingly awkward and ponderous hulks of birds can fly comes with some little shock of surprise. We expect them to drag their great bulk about clumsily just over the water, instead of which—after a somewhat splashy start that can be excused in such large, heavy birds—once they get in the air their rise isso easy and rapid that before one is aware they are away up and up until, at times, they vanish in the blue sky above.

In feeding, Pelicans paddle about the shallow water, head high, bill turned down against the breast, intently regarding the water below. When food is sighted, the bill is opened and plunged down and forward, the long slender sides of the lower mandible bow out, and the luckless victim is fairly scooped up. At the end of the scoop when the pressure of water in the pouch is relieved the sides spring together, the upper mandible closes down on the narrow opening, and, as the water is strained out, the contents are retained either to be swallowed immediately or to be carried safely in the capacious pouch to the gangling fledglings at home. Pelicans often fish far from their nests and they may be seen, for many miles about a colony, passing back and forth engaged in the toil of keeping themselves and their families supplied with food.

Pelicans are one of the spectacular features of prairie wild life and are a great æsthetic asset where objects of striking interest are particularly desirable. They are well worth the small price of such coarse fish as they feed upon. All large birds suffer from thoughtless persecution by careless men. It would seem as though size alone were regarded as sufficient crime to turn every gun against its unhappy possessor. This has been true of the Pelican, as it has been of other large birds of greater sporting or food value. Pelicans are never eaten and their carcasses serve no other purpose than to befoul the air, yet gunners are all too few who can withold their shot when such striking targets come close. The fact that they eat a few fish is the expressed excuse, but if this class of fish protectionists were as concerned about the acts of poaching humans as they are about those of birds there would probably be more fish, and those taken by the Pelicans would not be missed.

Pelicans generally nest in large communities on islands or other isolated spots in the larger lakes, where they are fairly secure from their natural enemies. They are in many cases associated with Cormorants, Herons, and Gulls. Although such a community is by its insularity normally secure from foxes, coyotes, and other vermin, it is not safe from man. Cases have been known where adjoining residents have placed pigs on such islands to fatten on the eggs and young. It is to be hoped that such things are of the past. With the settling of the country, the draining of the lakes, reclamation and other improvement schemes, inaccessible and retired spots where these and similar birds can nest undisturbed are constantly growing scarcer. These almost unavoidable changes, added to promiscuous shooting, are constantly reducing the numbers of these birds, and if nothing were done to check the destruction, they, together with the Trumpeter Swan and the Whooping Crane—which resemble them in size and nesting range—would shortly be extinct. Fortunately, a number of bird reserves have been established about many of the prairie lakes by Provincial and Federal legislation. It is hoped and expected that some or all of these species may survive indefinitely, and continue to add their attractions to the prairie landscape.

Economic Status. Probably almost entirely fish-eaters. All stomachs examined by the writer have contained the coarser and more sluggish, easily-caught fish of the weedy shallows, usually those of smaller size. Undoubtedly, too many Pelicans on the shallow lakes would injure the fishing, but the greater danger today is to the Pelicans rather than to the fish. They are conspicuous birds, their numbers are likely to be over rather than under estimated, inducing an uneasiness as to their effect that a more careful comparison with the area covered would quiet.

126. **California Brown Pelican.** *Pelecanus californicus.* L, 53 or more. Sooty brown below; grey, narrowly streaked with brown, above. Face, mane-like crest, and narrow line along gular pouch, white, in striking contrast with very dark brown hindneck. Gular pouch dark in colour.

Distinctions. Above description obvious. Differing from the Eastern Brown Pelican only in slightly larger size and small details.

Field Marks. Any dark-coloured Pelican on west coast would be this species.

Nesting. On the ground, in large communities, on islands, sometimes on steeply sloping shores.

Distribution. Pacific coast, from Washington south to Ecuador, breeding from California southward. We have a few records of occurrence in southern British Columbia, near the mouth of Fraser river.

Only an accidental visitor near the south end of Vancouver island, but so well marked that it should be easily recognized on sight. A most spectacular feature of this species is that, unlike the White Pelican, it regularly dives for food from the wing.

Order—Anseres. Lamellirostral Swimmers. Sieve-billed Swimmers

General Description. Swimming birds with four toes but only two webs, having bills with a hooked or flat nail at the tip and furnished with tooth-like projections or thin laminæ on the sides (Figures 7-10, and 112-144), through which they strain the water from their food.

Distinctions. As above.

Field Marks. The outstretched neck, obvious tail, and rapid wing beats of the Ducks, or the long powerful wing strokes of the Geese, are familiar to most of us. In the water some species bear superficial resemblance to the Divers, but the straight, narrow bills of the latter, the obvious tails of the Ducks, the general outline and carriage, and the readiness to fly instead of dive when disturbed, should make differentiation easy.

Nesting. Usually on the ground, sometimes in hollow trees, and only rarely in deserted nests of Hawks or other large birds, but seldom far from water. The young are able to run about and take to water as soon as hatched, but how they are brought to the ground from a tree nest 20 or 30 or even 100 feet in the air is a subject upon which opinion is divided. Probably methods differ according to species and conditions.

Distribution. The *Anseres* are of world-wide distribution. In America the majority of the species breed north of our southern boundary. They may, therefore, be regarded as birds of northern distribution. In winter, the hardier species are likely to remain with us as long as open water continues and large numbers are to be found throughout the season on the waters of the west coast.

The order *Anseres* contains but one family—*Anatidae*, composed of the Mergansers, Ducks, Geese, and Swans. It comprises, therefore, the great bulk of the larger wild fowl pursued by sportsmen. One of the greatest sources of confusion in distinguishing the various species is the occurrence of what is called the "eclipse plumage". In midsummer the males of most species of ducks moult into a special body plumage, closely resembling that of the female, and known as the "eclipse plumage." It is retained for only a short time, giving way to the autumn plumage which is retained throughout the winter and with wear and some renewal usually serves as the basis of the following spring or breeding regalia. While the eclipse plumage is carried the birds remain in the deepest recesses of the marshes or well out in the open water where no danger can approach unseen. So secretive are they at this time, that even in the best of duck grounds they are seldom seen, and specimens in this plumage are difficult to secure and rare in collections. Another peculiarity of the summer moulting of this order is that all the wing feathers are shed at once and the birds are flightless until the wings are grown again. Most other birds lose and replace the flight quills gradually, corresponding feathers being dropped from each wing so that balance is not disturbed and the power of flight is never lost. However, it is a mistake to imagine that such wingless birds are helpless. Marsh-inhabiting Ducks are expert hiders and can elude the eyes of most of their enemies, and those that betake themselves to open water at this time are such accomplished divers that they can evade most attacks that do not take them by surprise.

By the time the legitimate shooting season has opened most Ducks are well pinioned again and almost in full winter plumage, but enough changing and unchanged birds remain to make a confusing number of obscure plumages that greatly complicate identification.[1]

In certain northern localities the more primitive Indians and Eskimos formerly took advantage of this flightless season to make regular organized drives, against which the bird's usual means of escape were useless, and numbers of "flappers" were taken and salted for winter use. Throughout the north the necessity for this is growing less, but there may still remain a few native communities where life is dependent upon such sources of food supply of which they cannot be deprived without grim hardship unless some substitute is offered. However, although we must recognize this necessity at times in aboriginal inhabitants, it does not follow that strangers who enter such country for the purposes of personal gain or adventure should be allowed to rely on its scanty resources. Such adventurers should provide themselves beforehand against the known conditions of the country which they are about to enter.

One of the most serious problems of the conservationist is the terrific mortality that occasionally overtakes large numbers of Ducks on certain inland lakes. Much of the prairie water and some in the interior of British Columbia contains large amounts of various salts in solution. Such waters are colloquially called "alkaline," irrespective of the chemical nature of their impurities. Most of the sloughs and lakes are mere catch-basins without outlet and are in consequence dead water. Alkali is constantly being washed into them and the water-level is governed only by evaporation. The consequence is that the alkali content becomes concentrated. At the end of long, dry spells, many lakes of formerly large superficial area are represented by small pools of stingingly bitter water of complicated chemical content. Many of these waters become highly poisonous to certain species of Ducks that flock to them from neighbouring drying sloughs and pools, and they perish by hundreds and are washed up in windrows along the shores. The preliminary illness is not contagious and birds if not too far gone when given pure water make rapid recovery. Another and similar disaster occasionally occurs. When, in a specially dry season, large slough areas dry up late in summer, we find them thronged with young Ducks not yet able to fly, or with old ones in flightless moult. These, neither able to leave the locality nor to find food in it, also perish. No practical preventive has yet been proposed. Over a course of years many hundreds of thousands of birds have perished in this manner on the continent, for the condition is not peculiar to Canada.

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[1] Another common source of confusion is the prevalence of a red rust coloration that often occurs on various parts of the head or body, and is common to many species of *Anseres*. It is due to an iron deposit from the water the birds inhabit and should be distinguished from normal plumage coloration.

Economic Status. The *Anseres* form, economically, one of the most important orders of birds; not, as is the case with other birds, so much on account of their food habits—these being largely of negative influence in human affairs—as in other ways. In the early days of settlement of the country Ducks and Geese furnished a most important food supply to the struggling inhabitants and even now the total number annually killed by sportsmen is an impressive addition to our food resources. Undoubtedly, the greatest usefulness of these birds is as a source of healthy, wholesome recreation, lending attraction to the outdoors and assisting in the upbuilding of a strong virile race, familiar with field life and the use of firearms—qualities of no mean importance to any nation in time of need.

Of the great flocks of wild fowl that formerly frequented the marshes of the East, only a shadow remains. Those of the West, too, were fast becoming depleted, and to the older prairie residents the number of waterfowl today, though still the envy of the eastern sportsman, is sadly reduced. The causes of this are various, some unavoidable, though others may be controlled. Contrary to a very general impression, the great breeding stronghold of wild waterfowl is not a great, vague, far north, but on the lakes and sloughs of our prairies in the midst of what is now settled cultivation. We cannot expect that vast acreages can be brought under cultivation without some reduction of wild life, nor that the temptation of an easy food supply right at the door could always be resisted by the early settlers when meat was scarce, and game laws, if any, difficult of enforcement. The draining of sloughs and marshes has also progressively restricted the breeding and feeding area of many of these birds—a word of caution in this direction has already been given under the heading of Franklins' Gull, page 60.

Even on grounds suitable only for grazing, the new conditions have seriously affected the breeding of various species. Cattle crop close around the margins of sloughs, and often the nests that escape the trampling of feeding herds are exposed to the eyes of natural enemies. Haying, when extended close to pools, although carried on too late in the season to disturb the current nestings, destroys the cover for early use next season. Leaving a belt of growth about the ponds is only a partial precaution as it crowds the nesting life into narrow belts, conspicuous in the mown meadows and tilled fields, and makes an easy hunting ground for predaceous crow, fox, coyote, cat, or dog. Among the natural enemies, undoubtedly the Crow ranks high. Accounts indicate that these birds of ill repute have increased enormously since the first settlement of the country, and experience shows that under present conditions they work havoc with the eggs and young of all kinds of nesting birds. Of this, more will be said under Crow, page 261.

But all these natural or indirectly human causes of the decrease of our Ducks are probably unimportant in comparison with the direct effect of man in his spring shooting, wanton over-shooting, market-hunting, and general wasteful practices. Spring shooting is particularly pernicious as it takes the best of the breeding stock—the strongest and hardiest birds that have survived the dangers of a double migration, the severity of winter conditions, and are just ready to increase and multiply. To kill these birds is like drawing on the principal instead of the interest for current expenses. Previous to the conclusion of the Migratory Birds Convention Act with the United States each province and state had its own independent game laws. Some legal seasons were long, some were short, but on the average each was set to get the maximum toll from the passing flocks. In many cases the birds were never out of hearing of the guns that spread destruction among them from the time the season opened in the autumn on our prairies until the following breeding season. Our open seasons may have been but a scant two months, but many of the birds owing to their moving from one jurisdiction to another in their migratory flights suffered eight months or more of continuous lawful shooting. As long as each province or state through which the birds passed in their great annual journeys made its own game laws, with only the advantage of its own constituents in view, the general good was certain to suffer. The tendency of each community to shoot as long as there was anything to shoot and to make certain that each got as much as its neighbour, could be corrected only by a central control that had power to adjudicate between interests and apportion them according to the recuperative powers of the species affected. This was accomplished by the Migratory Birds Convention between the United States and Canada. By this treaty, for the first time, Canada has a voice in the formation of game laws in states outside her jurisdiction and is assured that protection to Canadian migrating game birds follows them south, and that we are not protecting birds solely for the benefit of foreigners.

The effect of the Act on wild fowl has been more beneficial than its most enthusiastic advocates had hoped. With the elimination of spring shooting and market-hunting, and with reasonable open seasons intelligently allotted to various localities over the whole continent, the rapid reduction of our wild fowl has been stayed, and their numbers even increased. Today we feel confident that the question of using without destroying our migratory game has been solved; that we can continue to have good sport and yet leave this great patrimony undiminished to posterity.

One other important question remains to be solved, that of shooting grounds for the general public. It matters little to the ordinary man whether we have many or few game birds if the best shooting grounds are in the hands of private individuals and clubs. As Canadians we do not take kindly to private preserves and privileged classes. Already large, suitable areas have been set aside from the government lands for reserves, where birds may breed undisturbed by cattle or by haymaking and other human activities. These reserves will tend to scatter their surplus life about the surrounding country and offer sport beyond their confines. Some of them may, under proper regulation, furnish suitable shooting grounds for the general public in localities where many such spots are already under private control and open to none but a privileged few. Just how far it is possible to proceed along these lines will depend altogether on the attitude of the interested public.

The grain-eating proclivities of some Ducks is a factor that cannot be quite overlooked. It seems hardly believable to experienced eastern shooters that wild Ducks can occur in such numbers as to be seriously detrimental to agriculture. In some parts of the Prairie Provinces, where large numbers of some species—mostly Mallards—concentrate in the early autumn, the cost of their support in some cases falls heavily upon the fields they frequent. Geese are occasionally as bad, cropping the newly sprouting grain to such an extent as to make replanting necessary and cause the loss of valuable growing time. Complaints of this kind are naturally often selfishly exaggerated, but there is enough truth in them to warrant serious consideration. When the Duck season opens the remedy is obvious, but if closed there is occasionally a race between the harvesters and the Ducks as to who will get the most grain from certain fields. It is not always the grain actually consumed that is in question, but the fact that the trampled condition of the straw may prevent proper harvesting. It is said that in spring when the grain is well rooted Geese bite off only the tender tops without disturbing the roots, and thus encourage a stronger growth of the plants, which is an advantage rather than a detriment. When the ground is soaked and soft the roots may come up with the tops and cause real loss to the farmers. Though the Migratory Birds Convention Act provides for just such cases, it requires the nicest discrimination to recognize legitimate complaints and to furnish necessary relief in time to be effective. This is one of the problems of game protection that can be solved satisfactorily only with the honest and sincere co-operation of all concerned. Local sentiment among neighbours who personally know specific conditions can do more to permit quick action in such matters than any amount of official investigation that would otherwise be necessary.

A peculiar condition affecting Ducks occurs on the northern Pacific coast. The immense number of salmon that frequent the western streams differ in habit from the eastern fish in that they spawn but once in their lives. After working upstream they spawn and die, and are washed ashore in windrows to pollute the atmosphere or sink to the bottom where, in slack-water pools, they lie in decaying masses. Many of our otherwise most palatable and elsewhere eagerly prized Ducks feed upon this disgusting offal—and on salmon eggs—to such an extent as to become unfit for human consumption and even offensive to handle. Local conditions and the food they have been subsisting upon are important factors in deciding the palatability of different Ducks. In the east a wild Duck is a wild Duck and even Mergansers and coarse, heavy Scoters are sought for eagerly in some localities. Undoubtedly a shortage of numbers limits the choice and renders the consumer less critical. Wild-celery fed Canvas-back is the synonym for high-living in the east, whereas on the prairies grain-fed Mallard takes first place in the estimation of epicures, and such birds as Whistlers (Golden-eyes) and Bluebills (Scaup Ducks) are often looked upon as next to worthless. In the interior of British Columbia, other standards of excellence exist, and on the coast the edibility of wild fowl is strictly limited both by species and season because of the fish-eating habits just described.

FAMILY—ANATIDAE. DUCKS, GEESE, AND SWANS

General Description. As this is the only family included under the order *Anseres* the descriptive matter under the previous heading applies here and need not be repeated.

The family is divided into five subfamilies: the *Merginae* or Mergansers; *Anatinae* or River Ducks; *Fuligulinae* or Sea Ducks; *Anserinae* or Geese; and the *Cygninae* or Swans. For the characteristics of these see under proper headings following.

Subfamily—Merginae. Mergansers. Fish-Ducks. Saw-bills

General Description. Fish-eating Ducks with a more cylindrical, tapering, and less spatulate or flattened bill than the other Ducks (Figures 113, 114). The cutting edges of the mandibles have a series of serrations giving rise to the popular name "Saw-bill." The nail on the tip of the bill forms a small but evident hook. The hind toe (Figure 112) is developed into a flat paddle or fin-shaped lobe similar to that of the Sea Ducks and quite different from the hind toe of the River Ducks. The males are brightly and strikingly coloured, mostly in black and white. The females are dull coloured, with reddish heads and necks. Most plumages have crests. In the females and most young birds, the crests, to the casual eye, are ragged, and without well-defined shape.

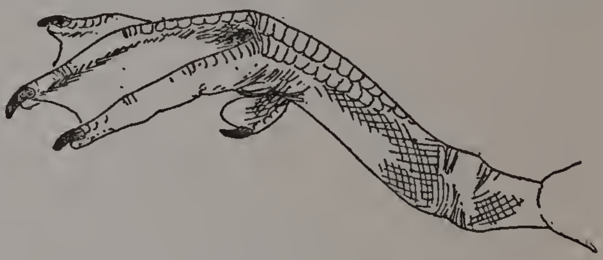


Figure 112
Foot of Merganser;
scale, ½.

Distinctions. The saw-toothed bill easily distinguishes the Mergansers from the Sea Ducks which resemble them in the character of the hind toe.

Field Marks. Typical Mergansers are long, slender Ducks with long, slim bills. The slenderness of general build and the long-headedness are apparent both at rest and in flight. When flying the bill, head, neck, and body are carried in a straight line which gives a drawn-out appearance that is quite characteristic. Mergansers, except the Hooded which is rather solitary, usually fly in long, single files or lengthened flocks approximating lines, rarely in irregular indiscriminate bunches as do other Ducks. They are seldom seen high in the air, but usually pass over the water low down and just above the surface. Scoters also have this habit, but are heavier in build and much blacker.

Nesting. Mergansers in the breeding season are mostly river haunters nesting either on the ground, among rocks, or in hollow trees.

Distribution. A small family; most of its species inhabit the northern hemisphere.

Mergansers feed upon fish and shell-fish captured under water by diving; for this method of feeding their hooked and serrated bills are admirably adapted. They are, during the breeding season, mostly fresh-water frequenters, though they visit the sea sometimes in large numbers. They are not very desirable as food, though some young autumn birds, properly cooked, are not to be altogether despised.

Economic Status. Mergansers eat fish and, in certain waters—such as at the heads of salmon streams—they may do appreciable harm. Ordinary trout streams are too small for these species and it is only in special circumstances that their depredations are serious. In waters that successfully withstand commercial fishing, the fish taken by even a considerable number of Mergansers may be disregarded. In streams where angling is the most important interest too many Mergansers may be a just cause of complaint. However, Mergansers, like other birds, tend to take the food most easily obtained. The fish most highly valued by sportsmen are those agile, game ones that are seldom pursued by Mergansers or other feathered fish-eaters when less active ones are available. These birds should not be condemned on suspicion, circumstantial evidence, or individual examples, but only after thorough investigation and proof of their destructiveness. The Migratory Birds Convention, on proper application, affords relief against birds that are doing serious damage, and if an examination by qualified investigators shows that valuable interests are being seriously injured, permits for *necessary* destruction can be obtained.

129. American Merganser. SAW-BILL. GOOSANDER. SHELDRAKE. SHELDUCK. *Mergus americanus.* L, 25.

Distinctions. Male: much similar to next species but larger and of heavier build throughout, without crest or reddish breast band and with more white less interrupted with black on flank, wings, and neck. The delicate salmon tint of the underbody is present only in the highest plumage and quickly fades to white in specimens. Female and young male are alike and not distinguishable from parallel plumages of the Red-breasted Merganser except by careful study of details. The head is generally a deeper brown and stops with a sharp line where it meets the grey of the lower neck. The upper throat usually has a well-defined pure white patch. The bill characteristics (Figure 113) are the only ones for absolute identification. The bill of the American is of heavier and less slender build, and the nostrils are set near the centre of its length instead of well within its basal half (compare with Figure 114). These are distinctions that are evident only when both species are in hand for direct comparison. The feathering of the base of the bill gives an absolute distinction. In this species the feathering of the sides of the two mandibles extends forward an approximately equal distance (Figure 113), instead of the upper featheration decidedly over-reaching the lower.

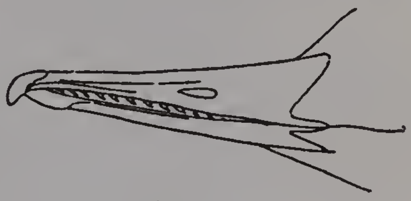


Figure 113
Bill of American Merganser; scale, ½.

Field Marks. In adult male, lack of crest and reddish breast band, and considerably more white on sides, flanks, and wings. In flight, the large amount of white on the bend of the wing and outer scapulars. It is doubtful whether females may be known in life with certainty from the Red-breasted Merganser. The darker brown of the head, its sharp ending on the neck, and the white throat are suggestive but not determinative characters.

Nesting. In hollow trees or rock cavities near water. Nest of grasses, etc.

Distribution. Common across the continent, nesting throughout western Canada, north to limit of trees.

The American Merganser is the larger of the two representatives of this genus, but generally frequents the smaller waters, streams, and lakes. It is less common than the Red-breasted on the larger lakes or the sea. Otherwise the two birds are similar in habit.

130. Red-breasted Merganser. SAW-BILL. FISH-DUCK. SHELDRAKE. SHELDUCK. *Mergus serrator.* L, 22. Plate VI A.

Distinctions. Male: similar to last species, but smaller and of lighter build throughout, with crest and reddish band across breast and with less white more interrupted with black on flank, wings, and neck. The delicate salmon tint of the underbody is present only in highest plumage and quickly fades to white in specimens. Female and young are alike and not distinguishable from parallel plumages of the American Merganser without careful study of details. The head is generally a paler red and blends gradually into the grey of the lower neck. The reddish colour suffuses over the throat which is usually light, but it rarely has a decided white patch. The bill characteristics are the only ones for certain identification. The bill of the Red-breasted is of lighter and more slender build and the nostrils are well within its basal half. These are comparative distinctions, only evident when both species are in hand for direct comparison. The feathering of the base of the bill is absolutely distinctive. In this species the feathering of sides of the upper mandible extends well forward of that on the lower (Figure 114).

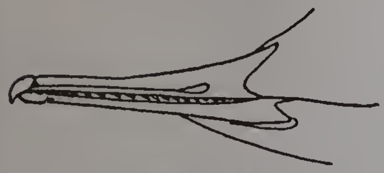


Figure 114
Bill of Red-breasted Merganser; scale, ½.

Field Marks. Like the preceding species except for—in adult male—presence of crest, immaculate white or pink underbody, dark breast band, and less white on sides, flank, and wings. In flight, smaller amount of white on bend of wing and outer scapulars. It is questionable whether females can be distinguished in life with certainty from the previous species. The paler red of the head, its gradual blending into the lower neck and body colour, and the lack of decided white throat patch are suggestive but not determinative.

Nesting. On ground near water, sometimes in trees.

Distribution. More or less common throughout Canada, nesting north to Arctic coast.

In general habits similar to the preceding, but more often seen on the larger waters and comparatively rare on small streams and pools.

131. **Hooded Merganser.** *Lophodytes cucullatus.* L, 17·50. The smallest of our Mergansers. The male is a most striking bird with great black and white "hood" and rich chestnut flanks. The distinctive hood is a flat, disklike crest, coloured pure white with a narrow black edge that rises from the forehead, makes a wide, circular arch over the head, and meets the neck at the nape. The female is much duller coloured, with brownish-fuscous body, lighter below, and with a thin, reddish-brown crest (Figure 115).

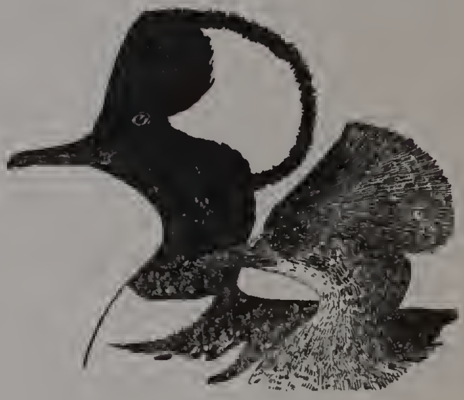


Figure 115
Hooded Merganser; scale ¼.
Male. Female.

Distinctions. The male is unlike any other bird on the continent. The female can always be distinguished by small size for its subfamily, and its entirely different coloration from other Mergansers in Canada.

Field Marks. The male with its strong black and white coloration and big hood is easily recognizable. The female and juvenile male are small, dull-coloured Ducks with thin crests. In flight, the contrasting black and white lanceolate striping of the tertials falling over the base of the wing can often be recognized.

Nesting. In hollow trees.

Distribution. More or less common over all of Canada, north to tree limit. It probably nests wherever it can find suitable timber.

The Hooded Merganser is a bird of quiet ponds and woodland pools. It is the most edible of the Mergansers, which fact, as well as the clearing of the timber, and its nesting in easily accessible localities, has probably reduced its numbers.

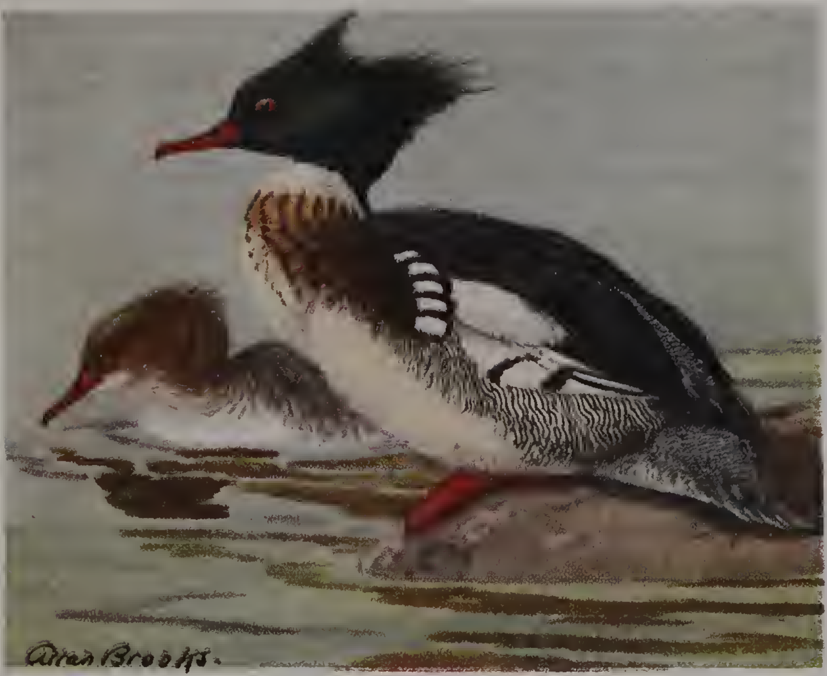
Economic Status. It is doubtful if any serious charge can be proved against this little Merganser. Its chosen haunts are not those of game or food fish, and it probably consumes a smaller proportion of fish than either of its larger relatives.

Subfamily—Anatinae. River and Pond Ducks

General Description. Typical Ducks with flattened spatulate bills, furnished with flat nail tip and straining laminæ or plates along the inner margins (Figure 8, page 24) instead of tooth-like projections (Figure 7, page 24). Feet with a small though well-formed hind toe, not modified into a flat lobe or fin-like appendage. (Figure 116).

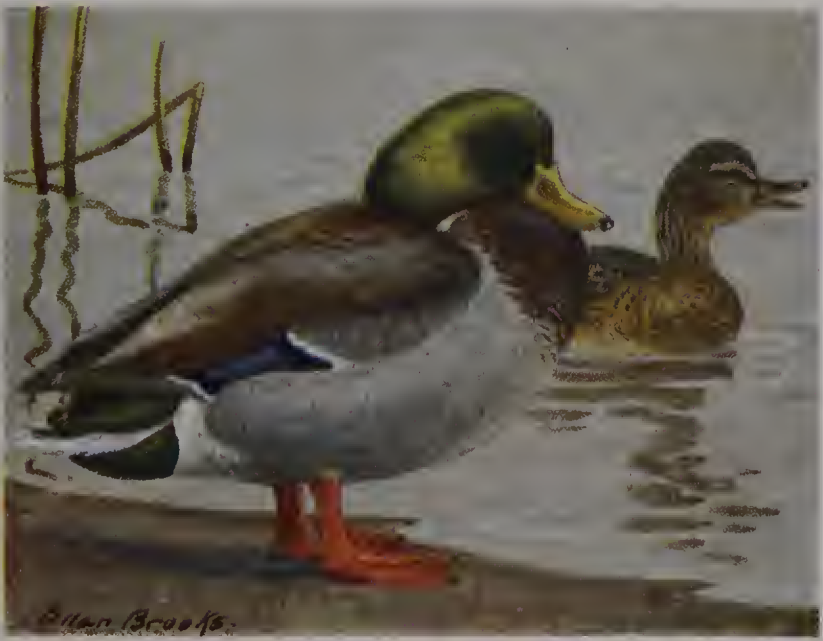
Distinctions. The bill will separate the River Ducks from the Mergansers; and the hind toe as above from the Sea Ducks.

Field Marks. Under favourable conditions the general outline, rounded head, and shorter, thicker bill will separate these, and the Sea or Bay Ducks, from the Mergansers. They rise more steeply from the water than either. When under way, the neck is inclined slightly upward from the body, and they lack the drawn-out appearance of the Mergansers. The flock formation is usually irregular with little order or alignment. They are more


Allan Brooks.

A. Red-breasted Merganser; scale, $\frac{1}{6}$

Female Male


Allan Brooks.

B. Mallard; scale, $\frac{1}{6}$

Male Female

difficult to tell from the Sea or Bay Ducks, but in general are longer and more shapely in appearance with more slender necks. They are probably more easily recognized by species.

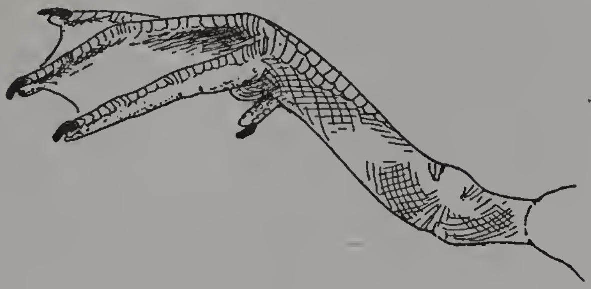


Figure 116
Foot of surface-feeding Duck;
scale, ½.

Nesting. Usually on the ground. Occasionally in trees.

Distribution. As a class the Pond and River Ducks are more abundant in the interior than on either coast.

As the names imply, the River and Pond Ducks frequent our smaller inland waters more than they do the larger ones. They feed from the surface by "tipping" and reaching under the water, and rarely dive. The food is gathered in the bill and the water squeezed out, the laminæ of the bills retaining the solid matter.

Economic Status. Being strictly water-birds and vegetable and insect feeders, their food habits generally are not harmful to human interests. It has lately been shown that Ducks feed largely upon mosquito larvæ and that they may do surprising good in this direction. By actual experiment, a pair of Ducks in a small pond did more to reduce these pests in it than a considerable school of goldfish. As game, they are of great importance, *See* page 75.

132. **Mallard.** GREEN-HEAD. *Anas platyrhynchos.* L, 23. Plate VI B.

Distinctions. The male cannot be mistaken for any other wild Duck, though many domestic strains approach it closely. The female is often referred to other species and is sometimes called "Grey Duck." There are several other Ducks approaching her in coloration, but the purple speculum with the white bar both before and behind the speculum are good distinguishing marks.

Field Marks. Green head and white neck-ring are conspicuous recognition marks for the adult male. The speculum with its white bars will identify the female in life. The tail of both sexes shows a general whiteness in flight that is quite characteristic.

Nesting. On the ground usually; in high grass or reeds occasionally at a considerable distance from water, and because of this it often thrives in sections from which other species have been driven away.

Distribution. Distributed over practically the whole of Canada except in the far north, but less common in the extreme east. Breeds throughout Canada except where disturbed by settlement.

This is the "Wild Duck" *par excellence,* and is known as such to the sportsman of the Old World as well as the New. It is the original stock from which our common domestic varieties sprang and nearly any mixed farmyard flock will show the green-black heads, white collar, or recurved uppertail-coverts denoting reversion to the original form. As well as being one of the best table-birds, it is one of the wariest of Ducks.

The Mallard is a strong and virile bird and it crosses with other Ducks more readily than any other. The results of such crosses are taken comparatively frequently, especially those with Pintail or Black Duck. It is interesting in such case to note that the typical Mallard speculum is a dominant factor and is almost invariably inherited in all crosses with other species.

"The Mallard is the most important duck of the west and must be classed among the first two or three game birds of North America. It is a capable bird; a prolific multiplier raising nine or ten young; hardy in the extreme; coming north at the break-up and remaining on the prairies until freeze-up; in the first rank as a table-bird; elusive and wary enough as game. It has taken to feeding on the fields to an extent approached by no other Duck and the wheat or barley-fed Mallard is to the epicure the equal of any northern Canvas-back. Wondrous flights to the fields are seen on the prairies in places and sometimes in September damage is done to the wheat shocks. Large numbers of Mallards are shot on the fields and this has made the bird available as game to many hunters who cannot shoot upon the marshes. Only in the coastal west where, sometimes, on account of its habit of eating decomposing salmon and so becoming unfit for food, is the bird other than a favorite."

133. **Black Duck.** BLACK MALLARD. DUSKY DUCK. *Anas rubripes.* L, 22. Very similar in general appearance to a very dark brown, almost black, female Mallard. In the male the general streakiness, though largely obscured by a uniform dark colour, persists strongly on the face. The same is true of the female to a less degree.

Distinctions. Besides the general dark coloration, the absence of white borders to the purple speculum fore and aft is distinctive in any plumage. There is no danger of confusing it with any of the black Scoters, because of the speculum and mallard-like bill, the hind toe of the River and Pond Ducks, and the streaky coloration on the face.

Field Marks. Very dark, almost black with a silvery sheen to the underwing surfaces. It is too rare a bird west of the Great Lakes to be recorded on sight identification.

Nesting. On the ground, near water.

Distribution. An eastern bird not commonly found west of the Great Lakes. There are several Manitoba records and one from Saskatchewan.

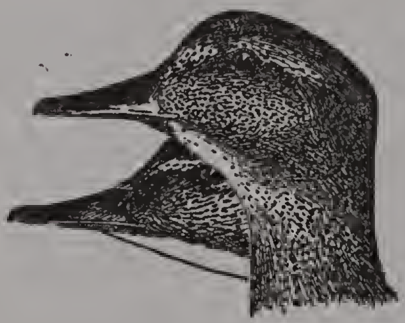


Figure 117
Gadwall; scale, ¼.
Female Male

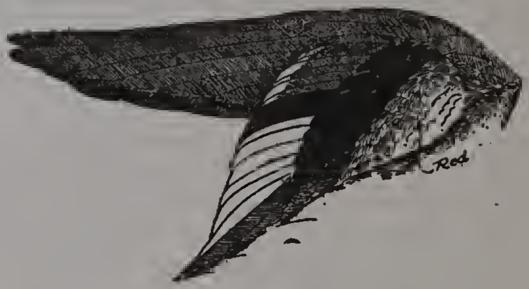
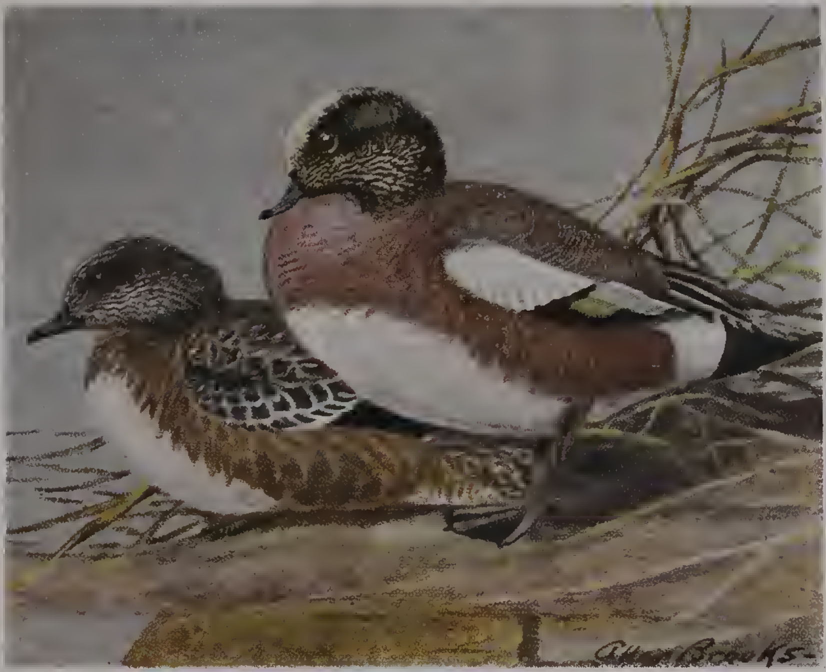


Figure 118
Wing of Gadwall;
scale, ¼.

135. **Gadwall.** GREY DUCK. SPECKLE-BELLY. *Chaulelasmus streperus.* L, 19·50. A streaked grey duck, white below, without much decided detail. Male: finely vermiculated crosswise on flanks and back; head and neck finely and evenly speckled (Figure 117). Female: streaked in much the same pattern as female Mallard. All plumages with large white speculum edged forward with dead black and with lesser wing coverts chestnut-red (Figure 118).

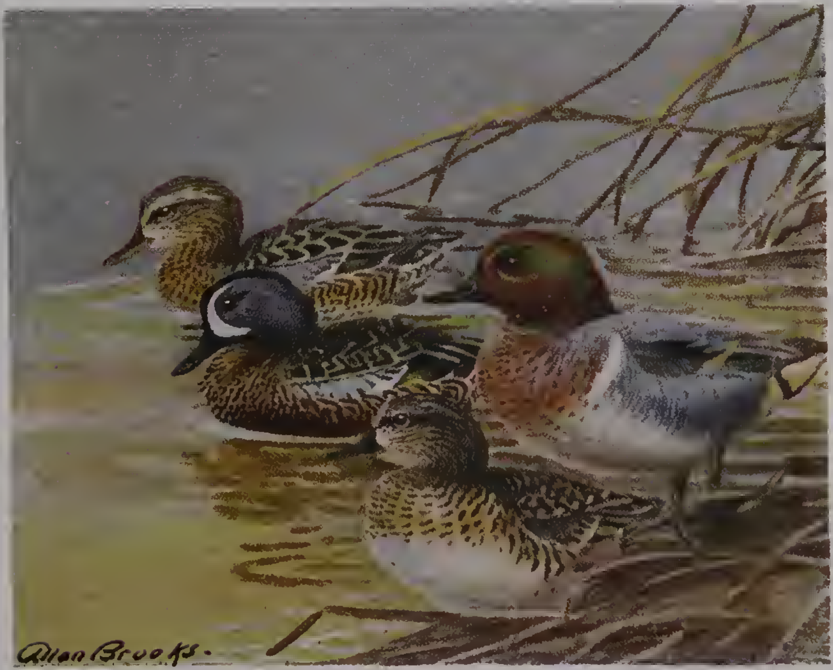
Distinctions. The large white speculum and chestnut-red upperwing coverts are always distinctive. In females and juveniles the red is sometimes scattered and faint, but always present.

Plate VII


Allan Brooks.

A. Baldpate; scale, $\frac{1}{6}$

Female Male


Allan Brooks.

B. Blue-winged Teal; scale, $\frac{1}{6}$
Female
Male

Green-winged Teal; scale, $\frac{1}{6}$
Male
Female

Field Marks. Male: a medium-sized Duck of greyish colour without obvious red or much detail except strong black and white area on folded wing. Female: like a small Mallard with a white speculum. In flight, the white speculum spot of the secondaries on the rear of the wing makes best recognition mark. More likely to be confused with Baldpate than any other Duck.

Nesting. On ground in grass or under bushes.

Distribution. Across the continent north of lake Athabaska. More common west than east of the Great Lakes.

136. **European Widgeon.** *Mareca penelope.* L, 19. Male: like the Baldpate or American Widgeon, but the head solid brick red from cream cap to base of neck. Female: hardly distinguishable from female Baldpate.

Distinctions. Red head of adult male distinctive. In other plumages probably only separated from Baldpate by having axillars thickly but finely speckled or marbled with grey (Figure 119) instead of being pure white, or very slightly marked or shaft streaked.

Field Marks. The species is too rare to be distinguished on sight, except the male with its Baldpate characters and plainly red head.

Distribution. Northern part of eastern hemisphere. Occasional records in eastern United States and on the west coast north as far as Wrangel island. In western Canada the only records have been from southern Vancouver island.

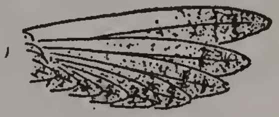


Figure 119
Speckled axillars of European Widgeon; scale, ½.

137. **Baldpate.** AMERICAN WIDGEON. *Mareca americana.* L, 19. Plate VII A.

Distinctions. The adult male with its white cap from which the vernacular name is derived, and the pinky vinaceous breast and flanks is distinctive enough. In all plumages may be known from any other common Duck by the white upperwing coverts, some rather patchy, backed by a velvety black speculum (Figure 121, compare with 118). No red on wings as in the Gadwall. From the European Widgeon it may be distinguished in all plumages by its spotless or nearly immaculate axillars (Figure 120).

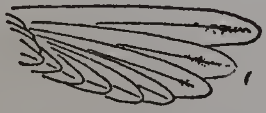


Figure 120
Plain axillars of Baldpate; scale, ½.

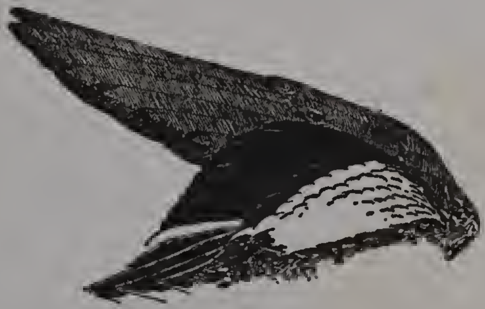


Figure 121
Wing of Baldpate; scale ½.

Field Marks. The male's white cap, vinaceous breast and flanks, and white patch on fore-wing. Both sexes when flying show a white patch on the forepart instead of rear edge of wing.

Nesting. On the ground in grass or under bushes.

Distribution. Ranges over nearly all of Canada. More common west than east of the Great Lakes. Breeds north to the mouth of the Mackenzie.

"This is a Duck more characteristic of the extreme west, being much better known on the coast waters than on the prairies. It is a hardy species, wintering well northward, a bird of large waters rather than of sloughs and ponds. Large flocks of these handsome birds, their flashing white wing patches showing even at a distance, are a common sight to the coastal sportsman. Though a prolific breeder and one of the most numerous of western Ducks it loses some popularity on account of its rather small size. Its flesh, however, ranks high and it apparently never becomes contaminated by fish-eating. It is one of the first of the coast Ducks to mate and turn north in spring."

139. **Green-winged Teal.** *Nettion carolinense.* L, 14·50. Plate VII B.

Distinctions. The smallest of our Ducks. Size will always distinguish it from all others except the Blue-winged and Cinnamon Teals, and the Buffle-head. The brilliant green speculum will distinguish it from the latter and the absence of chalky blue on the fore-wing from the former two.

Field Marks. Small size. In any plumage lack of chalky blue on wings distinguishes from the two other Teal, and the lack of white on the wings from the equally small Buffle-head.

Nesting. On the ground, near water.

Distribution. Across the continent, common everywhere in the west except perhaps the southern mid-prairie sections. Breeds north to the mouth of Mackenzie river.

One of the daintiest of the Ducks. Its habit of flying in large flocks and its great speed on the wing makes it well known to sportsmen. The ease with which it attains such high speed while other species seem to labour so strenuously is notable.

"Teal, both Green- and Blue-winged, are birds of the smaller waters, especially of the shallow prairie sloughs. Of the two, the Green-winged is the more universal bird. It is the earlier migrant in the spring and remains north much later than its blue-winged relative in autumn. Most Blue-wings leave the prairies in September, the Green-wings remain into the next month. Both are much given to frequenting the shallows and congregating in sunning parties on mudbanks and sandbars. They are eagerly sought by sportsmen, for in spite of their very small size no other Ducks are so fat and few as toothsome. Teal are shot much more easily than many other Ducks on account of their manner of flying in compact masses and where their great speed gives them little advantage against the scatter gun."

140. **Blue-winged Teal.** *Querquedula discors.* L, 16. Plate VII B.

Distinctions. One of the smallest of our Ducks. Small size and large area of chalky blue on wing, characteristics shared only by the Cinnamon Teal and the Shoveller. The latter is a very much larger bird. The former in adult male is too dissimilar for any confusion, being solid cinnamon-rufous almost all over. Females of Blue-winged and Cinnamon Teals are so much alike that probably some specimens will be impossible of separation by any known test. As a rule the female Blue-winged is less heavily and less broadly streaked or overwashed on breast and flanks and the bill is generally shorter and relatively slightly broader at the base.

Field Marks. Small size and large area of chalky blue on wings and white underwing surface like a Mallard, separate from all but the Cinnamon Teal. In adult males the difference in general coloration of these two species is too great for serious confusion. The females probably cannot be told apart in life and generally can be recognized only when accompanied by a mate whose identity is evident.

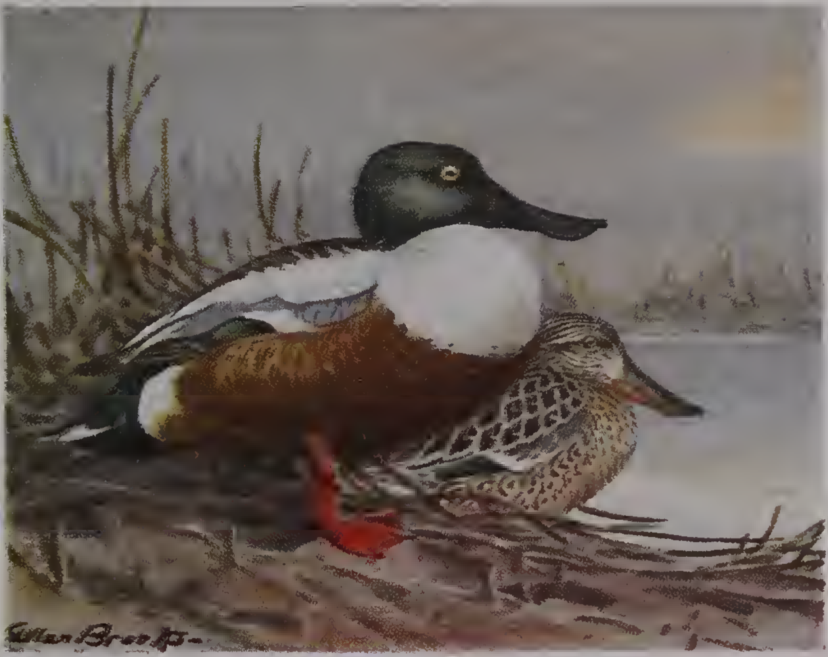
Nesting. On the ground amidst grass.

Distribution. Across the continent. Common through the prairie sections, rarer in the interior of British Columbia and practically absent from the Canadian west coast. Breeds north to Great Slave lake.

141. **Cinnamon Teal.** *Querquedula cyanoptera.* L, 16. One of the four smallest of our Ducks. Adult male: uniform rich cinnamon-red head, neck, shoulders, breast, and flanks. Green speculum. A large area of fore-wing chalky blue as in the Blue-winged Teal. Female: hardly separable from female of that species.

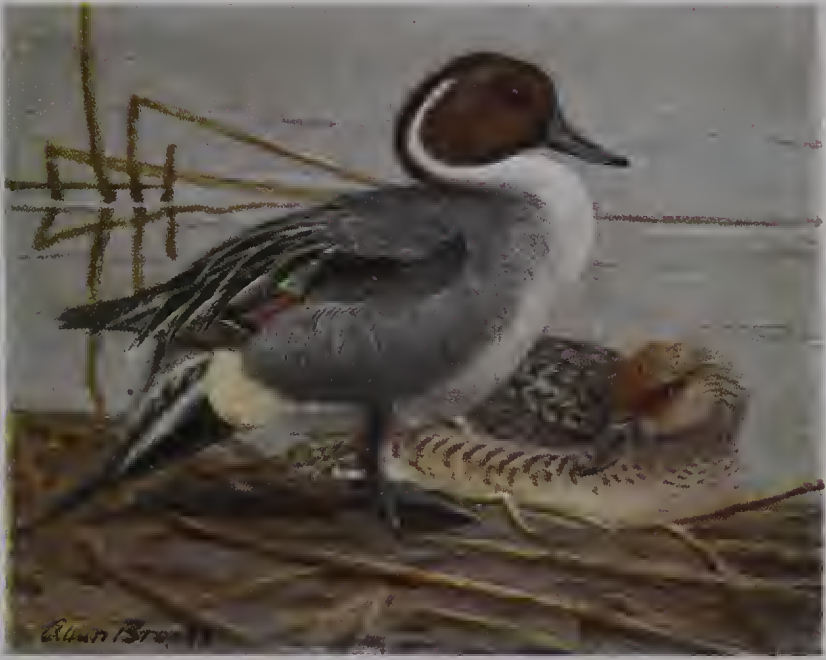
Distinctions. The male, with its strongly red coloration similar to the Ruddy Duck, but with wholly red head and blue wing patch, is easily recognized. The female can not always be separated from the female Blue-winged Teal. As a general rule it is more coarsely and heavily striped and overwashed with a richer brown on breast and flanks, and

PLATE VIII



A. Shoveller; scale, $\frac{1}{6}$

Male Female



B. Pintail; scale, $\frac{1}{6}$

Male Female

its bill is longer and more slender in proportion than in that species. These characteristics are not infallible and often it can only be identified by an accompanying mate. The common rust staining of the Blue or even the Green-winged Teal has often been the basis of records of this species.

Field Marks. Small size, general redness of body, white underwing surface like a Mallard, and chalky blue wing patches for the male. The female can hardly be distinguished in life from the female Blue-winged Teal.

Distribution. The west coast of southern British Columbia southward, and adjoining interior. There are a few substantiated records from Alberta and Saskatchewan where it should be looked for with care but identified with caution.

Nesting. Nest of grasses, on the ground. In some cases at considerable distance from water.

142. **Shoveller.** SPOONBILL. *Spatula clypeata.* L, 20. Plate VIII A. A good-sized Duck with a widened, spoon-shaped or shovel-shaped bill (Figure 122).

Distinctions. The Shoveller bill, remarkably spatulate at end with fringe of long, comb-like laminæ on sides of upper mandible, is characteristic in any plumage. The contrasting coloration of the adult male is striking. The female is much like the female Mallard, but smaller, without any speculum or marked wing pattern, but always with at least a suggestion of pale blue on the wings.

Field Marks. The striking coloration of the adult male is distinctive. The female is rather like the female Mallard, but without the strongly marked blue speculum. In any plumage and at considerable distance the slightly bulbous appearance of the bill is distinctly recognizable.

Nesting. On the ground, in the grass, but not always in the immediate vicinity of water.

Distribution. Common to both Old and New Worlds. Occurs in America across the continent, north to mouth of Mackenzie river. Breeds throughout western Canada.

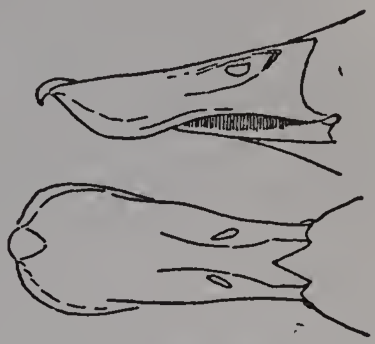


Figure 122

Bill of Shoveller; scale, ½.

"The Shoveller or Spoonbill is a lover of the mud, and consequently the shallow, muddy prairie sloughs are its favourite habitat. Like the Pintail it is a bird of the prairies. In flight when the turned-down bill cannot be noted it much resembles the Mallard, and many a sportsman has presumably shot a Mallard and picked up a Spoonbill. There is some prejudice among western sportsmen against the bird, owing to its small size and to the slight inferiority of the flesh when compared with that of several other species. This Duck is a late arrival in spring and migrates in September, and perhaps is seldom taken at its best in the north. The Shoveller, like the Pintail, sometimes joins the Mallards in their flights to the fields, but never alights with them to feed on dry land."

143. **Pintail** (Including **American Pintail**). SPRINGTAIL. SPRIG. *Dafila acuta.* L, 28. Plate VIII B. A large sized Duck, of striking coloration, with long, slender neck and long projecting centre tail feathers.

Distinctions. High plumage males are unmistakable. Females and juvenile males are like the female Mallard in general coloration, but without the prominent white bordered speculum. Instead, the speculum is dull bronze, bordered in front by a narrow cinnamon line and behind by a narrow one of white.

Field Marks. In any plumage, even when without the long "spring tail" or "sprigtail," the long neck and wings and general slenderness of this bird are recognizable in any attitude and, besides the striking colour pattern of the male or the absence of strong speculum of female, make the best recognition mark of the species.

Nesting. On the ground, in some cases at considerable distance from water.

Distribution. Of the northern hemispheres of both continents. In America north to Arctic coast. Nesting in Canada practically wherever found.

This is one of the widest ranging and most generally common of the Ducks.

SUBSPECIES. The American Pintail is now separated from the Old World form under the name *Dafila acuta tzitzihoa.*

"The Pintail is a Duck of the prairies, the prairie slough being its ideal habitat. As a game bird it is less popular than the Mallard, mainly because it does not often feed on the fields as that Duck does, and because it is smaller. The Pintail usually is the most numerous Duck upon the prairie sloughs. It is often the first Duck to arrive at the break-up in spring, but is not a late lingerer in the autumn, the largest flocks are seen in late August and September. A very early nester, raising large broods. A rather shy bird, speedy on the wing and capable of taking care of itself. This Duck claims second or third place in the hearts of the plainland hunters."

144. Wood Duck. SUMMER DUCK. *Aix sponsa.* L, 18·50. Plate IX A.

Distinctions. A very characteristic bird in any plumage. Even in the dull eclipse plumage the male shows a shadowy suggestion of the peculiar face markings. Owing to the demand for this bird as a semi-domesticated Duck on ornamental waters, dealers sometimes substitute the more easily procured female Mandarin Duck for that of this species. The males, though quite as gorgeous as the Mandarin, are perfectly distinctive, but the females are so similar that the substitution may not be immediately discovered. However, the Mandarin female lacks the long fleshy bill process running up the sides of the forehead, and the feather line is consequently straighter than in the Wood Duck.

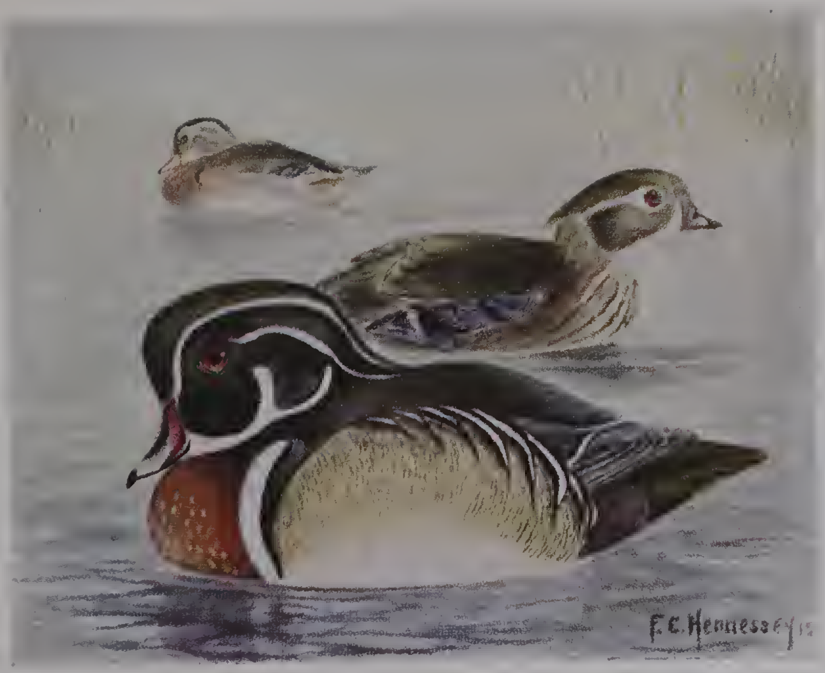
Field Marks. The down-hanging crest and the white throat of the male are often visible when all the rest of the bright coloration is lost in the distance or confused by the glare of the sun. The white eye-ring of the female is likewise quite conspicuous. When on wing the white underbody is sometimes quite distinctive, as this species seems to show more white than any other white-bellied Duck.

Nesting. In hollow trees or stumps in the vicinity of quiet water.

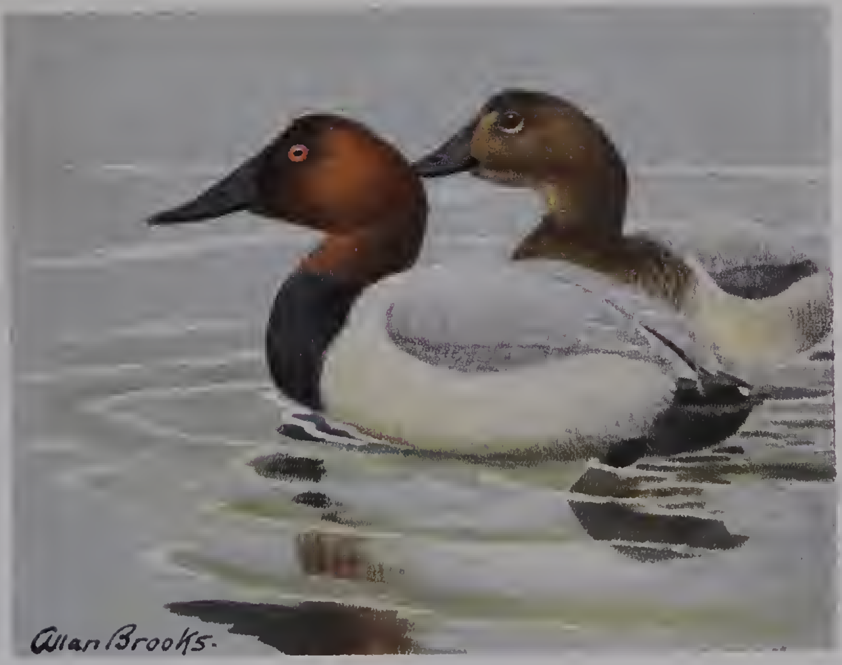
Distribution. Across the continent, north barely into Canada. A woodland bird and hence rare or absent throughout the prairies, more common in the east and in southern British Columbia.

This is the brightest coloured and most beautiful Duck in America and perhaps in the world. The only species that can approach it is the Mandarin Duck of China which is often seen in confinement with it. The Wood Duck was originally the "Summer Duck" of our southeastern borders and almost every woodland stream and backwater pond had at least one pair; but, since the clearing of the land, the farmer's-boy-shot-gun combination has been too much for it. Its bright colours, the relative conspicuousness of its nesting places, and the ease with which it can be stalked or "jumped" in its more or less wooded haunts, have made it an easy prey for even the inexperienced shooter and it was until lately in great danger of being exterminated. A Duck that alights in trees is more or less paradoxical to most European sportsmen, but this species does so commonly. It builds its nest in a hollow tree some distance from the ground, usually overlooking a quiet oxbow pond or other dead water. How the young are brought to the ground is not known, and many conflicting reports are circulated regarding it—such as the old birds carrying their young in their bills or on their backs, or shoving them out to take chances with their little unfledged wings in fluttering to the ground. In some way they reach the ground at an early age and follow the mother about the reaches of the streams or other quiet waters. Later they seek the marshes, which they inhabit through the autumn, leaving for the south before the first frost has chilled the waters.

The Wood Duck takes readily to nesting boxes prepared for the purpose and its numbers could probably be increased in this way.



A. Wood Duck; scale, ¼
Female
Male


Allan Brooks.

B. Canvas-back; scale, ⅙
Male Female

This is *not* the bird commonly called "Wood Duck" on the prairies and in the north. The birds generally so termed are the Golden-eye and the Buffle-head, both of which build in trees and seem fitted to the name.

The Wood Duck is a very beautiful bird and its disappearance would cause profound regret to all. The way in which its numbers have been reduced in the east indicates that it cannot withstand the dangers of modern sporting and other conditions as do hardier, shyer, and more inaccessible species. It never seems to have been, except in certain localities, as common as other Ducks, even in British Columbia, and though its numbers there may not be dangerously reduced, today the sportsmen of that province and elsewhere would be well advised to confine their shooting to other more numerous and more commonplace species and thus extend the close season by a gentleman's agreement. In the East, a long, close season, and the stopping of spring shooting, appear to have had the desired effect of increasing the numbers of this species, but it seems to many of us that the greater value of this wonderful little bird is as an object of beauty rather than of sport.

Subfamily— Fuligulinae. Bay, Sea, or Diving Ducks

General Description. Heavily or compactly built Ducks with typically flattened or spatulate duck-like bill sometimes swollen or high at base (Figures 135-138), but always with flattened nail at tip (Figures 123 and 124). Hind toe modified into a flat, paddle-shaped lobe (like Figure 112).

Distinctions. Bill will separate the Sea Ducks from Mergansers; and hind toe from River and Pond Ducks.

Field Marks. Rather difficult to distinguish from the River and Pond Ducks except as species. They are in general more heavily built, with thicker and usually shorter necks. They dive rather than tip in feeding; rise less steeply from the water, and alight more awkwardly.

Nesting. Usually on the ground, sometimes in trees.

Distribution. Cosmopolitan, common across the continent, but likely to be more numerous on the coasts than in the interior.

The Bay and Sea Ducks, though more at home on large waters, often frequent marshes and shallower waters for feeding or breeding. They are excellent divers, in some cases descending even to such depths as to become entangled in deeply set fish nets. The family includes some of our finest table-birds. Much said under previous subfamily, page 82, is true of these birds.

Economic Status. The direct economic importance of their food habits is as a rule even less than that of other Ducks.

146. **Redhead.** *Marila americana.* L, 19. Very similar in coloration to the Canvas-back, but slightly smaller and lighter in build (*See* Plate IX B of that species).

Distinctions. A little smaller than the Canvas-back from which it differs only slightly. Compared with that species, the male has a slightly darker back and the red of the head does not extend to the shoulders. Females are almost identical with female Canvas-back, but somewhat darker, and can always be distinguished by the shape of the bill. In this species the culmen has a concave instead of a comparatively straight profile (compare Figures 123 and 124). The female also bears a general resemblance to the female Scaup Duck and Ring-necked Duck, but is larger than either and has no white face mark. Large size and general coloration of male, when distinguishable, separate it from anything but the Canvas-back.

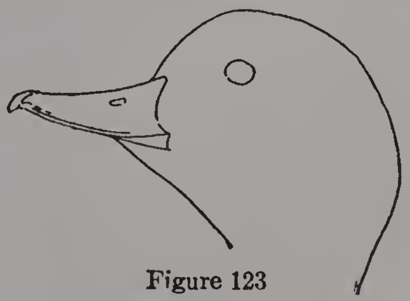


Figure 123

Head outline of Redhead; scale, ½.

Field Marks. Large size, and general coloration of male when distinguishable, will separate it from anything but the Canvas-back. The outline of the head with crown rising abruptly from the base of concave bill (Figure 123) gives a round-headed appearance that will distinguish it from the Canvas-back at a considerable distance. The brick-red of head stopping in mid-neck instead of continuing to shoulders is a good recognition mark at close range. Females are appreciably darker than female Canvas-backs, but probably cannot be told from them in life by colour alone under ordinary conditions. They resemble Scaups or Ring-necks, but are considerably larger, generally paler, without white face mark or white wing stripe.

Nesting. Nest of reeds lined with down, over water.

Distribution. Across the continent, more common in the interior than on the coast. Breeds in the west north to Great Slave lake.

The Redhead is so closely associated with the Canvas-back that discussion under that species will apply to both.

147. **Canvas-back.** *Marila valisneria.* L, 21. Plate IX B. Differing from the Redhead principally in slightly larger size and heavier build.

Distinctions. Slightly larger than the Redhead from which it differs only in small details. Compared with that species the male has a slightly lighter back, and the red of the head extends down to shoulders. Females are nearly identical with female Redheads, but somewhat lighter, and can always be distinguished by the shape of the bill. In this species, the culmen has a straight instead of a concave profile (compare Figures 124 with 123). The female has also a general resemblance to the female Scaup and Ring-necked Ducks, but is larger and has no white face mark.

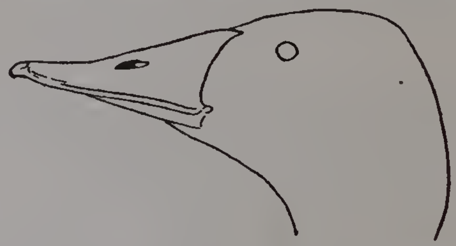


Figure 124
Head outline of Canvas-back; scale, ⅓.

Field Marks. Large size. General coloration of adult male when distinguishable separates it from anything but the Redhead. The outline of head with heavy "nose," and crown slanting back from base of the straight bill, gives a long-headed appearance and is a characteristic by which it may be separated from any other species at considerable distance. The brick-red of head continuing to shoulders is a good recognition mark at close range. Females are appreciably lighter than female Redheads, but probably under ordinary conditions may not be told from them in life by colour alone. They resemble Scaups or Ring-necks, but are considerably larger, generally paler, and without white face mark or white wing stripe.

Nesting. Nest of reeds lined with down, over water.

Distribution. Across the continent, more common in the interior than on the coast. Breeds in the west north to Great Slave lake.

"Canvas-backs and Redheads have more in common than mere appearance. They are both deepwater Ducks and expert divers, and are found together frequenting the same lakes and marshes. Their principal food seems to be the tuberous roots of pond weeds and is secured at depths of from 2 to 10 feet. To many sportsmen the Canvas-back ranks first amongst the Ducks and its praises have been sung for generations. To the western epicure, however, it is surpassed as a delicacy by the wheat-fed Mallard and it is probable that it does not reach its stage of especial excellence until fattened on the wild celery of the southern marshes. Both Canvas-back and Redhead make regular flights morning and evening and are constantly on the wing on windy days. They are shot either on flight ways, while passing from one slough to another, or over decoys on the water. The Canvas-back is one of the speediest of Ducks on the wing, a hard target, hard to kill and difficult to retrieve, but the largest and heaviest when taken. It is probably because of these qualities that it has withstood the hunter much better than the Redhead."

148. **Greater Scaup Duck.** SCAUP DUCK. BLUEBILL. BROAD-BILL. LAKE BLUEBILL. *Marila marila.* L, 18·50. Like a larger edition of the Scaup Duck shown on Plate X A.

Distinctions. Difficult to separate from the Lesser Scaup, but larger. Male with greenish instead of purple reflections on head. In any plumage except occasional young birds, distinguished from the Lesser Scaup by the white to near-white on the outer webs of the inner primaries (Figure 125, compare with Figure 126). In the Lesser Scaup this light spot may be represented by a pale area, but it does not reach the clear white of this species. The females resemble the females of several other species, but can be separated from all except the female Lesser Scaup and the Ring-neck by the white spot at base of the bill, and from the latter, together with the Redhead and Canvas-back, by the white instead of grey speculum.

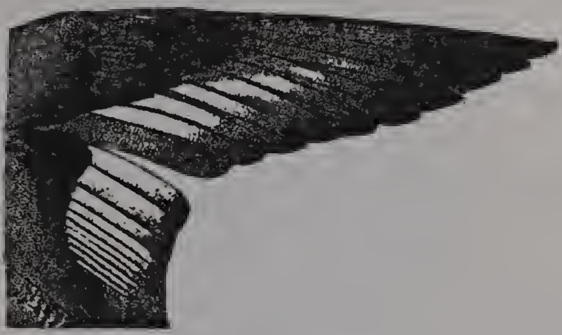


Figure 125
Wing of Greater Scaup Duck;
scale, about ⅓.

Field Marks. In general the adult male Scaups appear black for the front half of the body and white for the remainder, a colour pattern visible at a considerable distance. At rest, distinguished from the male Ring-neck by light instead of black back; in flight in any plumage by white instead of grey speculum. An experienced eye can sometimes tell the two Scaups apart in life by the white on the primaries as above, otherwise, as small differences in size are very deceptive, they are probably inseparable in the field. The female is distinct from all white-bellied brown Ducks except the Lesser Scaup and the Ring-neck by the white spot at the base of the bill, and from the latter and the Redhead and Canvas-back by the white instead of grey speculum.

Nesting. On the ground, near grassy ponds.

Distribution. Common to New and Old Worlds. In America, across the continent. Many of our breeding records for this species have been confused with the next. We have no authenticated nesting record from the prairies or British Columbia where it seems to be a migrant only. Known to nest north at least as far as Great Slave lake. It is more common on the coast than in the interior.

Much information founded on accurate specific identification is desired as to the occurrence, nesting, and migration of this species. It is more of an open or large water bird than the Lesser Scaup, but is often found in the marshes and shallows in company with it.

149. **Lesser Scaup Duck.** BLUEBILL. BROAD-BILL. LITTLE BLUEBILL. MARSH BLUEBILL. *Marila affinis.* L, 16·50. Plate X A.

Distinctions. Difficult to separate from the Greater Scaup, though slightly smaller. Male: with purplish instead of greenish reflections on head. In any plumage except occasional young birds distinguished from the Greater by the absence of white or near-white on the outer web of the inner primaries (Figure 126, compare with 125). In this species this area may pale a little, but it never approaches the whiteness of the Greater Scaup. The female resembles the female of several other species, but may be separated from all except the Ring-neck by the white spot at base of bill and from that species together with the Redhead and Canvas-back by the white instead of grey speculum.

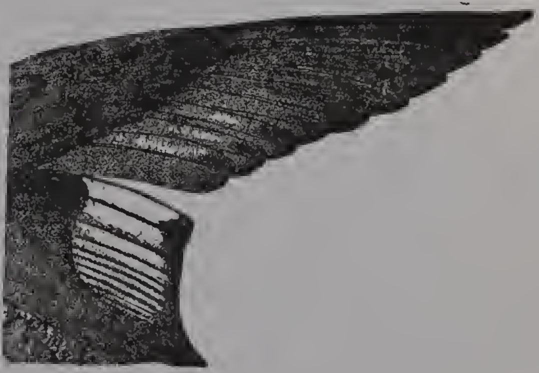


Figure 126
Wing of Lesser Scaup Duck;
scale, about ⅓.

Field Marks. In general, male Scaups appear black for the front half of body and white for the remainder, a colour pattern visible at considerable distances. At rest, distinguished from the male Ring-neck by light instead of black back and in flight, in any plumage, by the white instead of grey speculum. An experienced eye can sometimes tell the two Scaups apart in life by the colour characters of the primaries as above, otherwise, as size is a deceptive character, they are probably inseparable in the field. The female is distinguished from all other white-bellied brown Ducks, except the Greater Scaup and the Ring-neck, by the white spot at the base of the bill, and from the latter as well as the Redhead and Canvas-back by the white instead of grey speculum.

Nesting. On the ground, near grassy ponds.

Distribution. Across the continent. Breeds throughout the Canadian west, north to near the Arctic coast.

This is the Scaup commonly breeding throughout the Canadian prairies and southern British Columbia. All records of the Greater nesting within this area have proved upon investigation to be this species.

"The Lesser is the most numerous Scaup on the prairies, as the Greater is on the coast. They are both deep water feeders, diving for their food much as do the Canvas-back and Redheads, and spend most of their time on the open water of the lakes or the shallow bays of the coast. The Lesser is most numerous on the plains and marshes just before the freeze-up and many migrate only when driven out by the freezing of the waters. Such birds are invariably very fat. Scaups are not very enthusiastically hunted but are taken in the same manner as Canvas-backs, by both flight and decoy shooting. They are speedy flyers, but as they travel in straight lines and bunch compactly in the flock, they lose the advantage of their speed, and are easily shot."

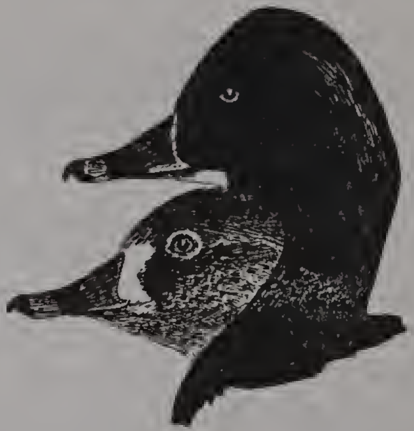


Figure 127
Ring-necked Duck; scale, ½.
Female Male

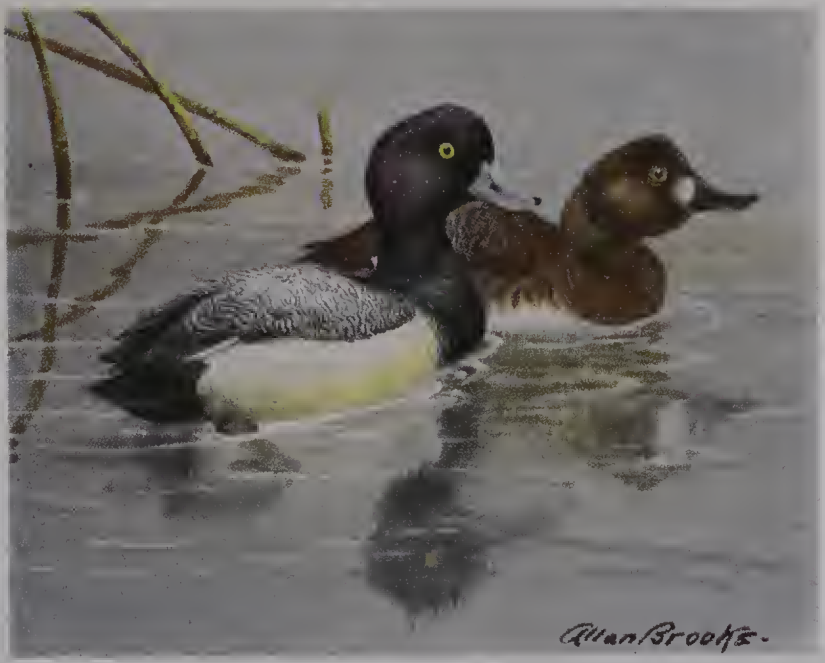
150. **Ring-necked Duck.** RING-BILLED DUCK. *Marila collaris.* L, 16·50. Like a very small Scaup with a black back and in highest plumage with a faint reddish or coppery band about the middle of neck and a light ring about bill (Figure 127).

Distinctions. Size and general scaup-like coloration in all plumages. The adult male has a solidly black back, two white rings on bill, coppery neck band, and grey speculum. The neck band is usually somewhat vague and partly suggested by a greyish or brownish one on the Scaups. The female and juvenile are very like comparable plumages of the Scaups. The grey instead of white speculum is the best distinction between them. The white patches at base of bill, meeting across chin, will separate Ring-necks from any other Duck with grey speculum.

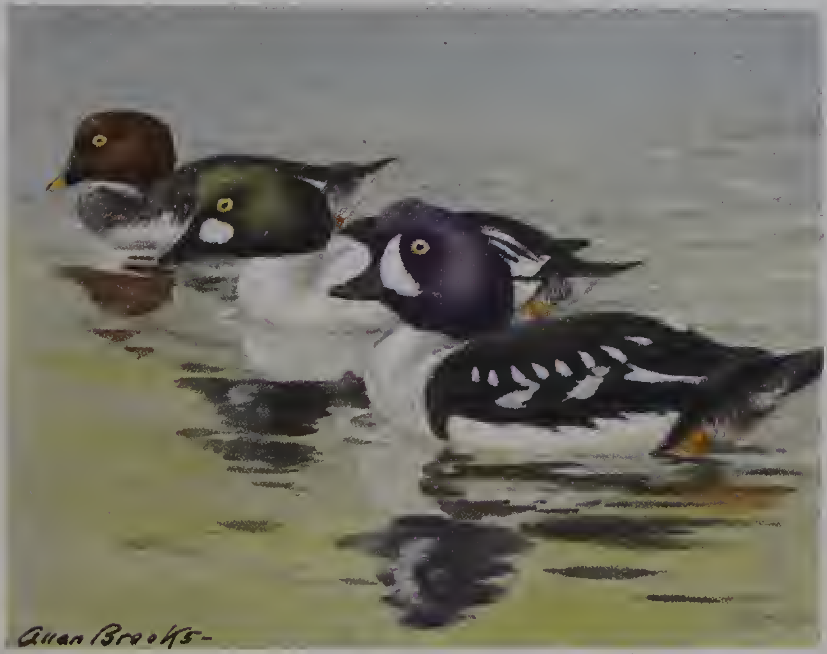
Field Marks. The male is like a small Scaup with a black back, but with the light grey flank feathers overlapping the wings and part of the back; in life it appears as a white-bodied bird. The head has also a fuller crest than the Scaups, giving an entirely different contour to the head. Other plumages probably can be separated from the two Scaups only by the grey instead of flashing white speculum.

Nesting. On the ground, near grassy ponds.

PLATE X



A. Lesser Scaup Duck; scale, $\frac{1}{6}$
Male Female



B. American Golden-eye; scale, $\frac{1}{6}$ Barrow's Golden-eye; scale, $\frac{1}{6}$
Female Male Male

Distribution. Across the continent, but records of the Ring-necked are so confused with those of the Scaups that the ranges are not very well delimited. It appears to breed in the woodland regions north of the prairies, north at least to the Mackenzie valley, and in the Cariboo district of British Columbia. More information is desired concerning the breeding habits of this bird.

151. **American Golden-eye.** WHISTLER. WHISTLEWING. GREATHEAD. (*Incorrectly* WOOD DUCK). *Glaucionetta clangula.* L, 20. Plate X B. The male is a striking black and white Duck with yellow eyes. The female is light coloured, with sharply contrasted seal-brown head.

Distinctions. The adult male is too distinct in coloration to be confused with anything except Barrow's Golden-eye. The juvenile male and female can be distinguished from all similar birds by general lightness; back ashy grey rather than brownish, and seal-brown head sharply contrasting with a white neck. The adult male differs from the male of Barrow's Golden-eye in having greenish instead of purple reflections to head, oval instead of crescentic white face mark; flank, feather group with narrower black border and with considerably more white in wing and back pattern. Juvenile males and females can best be separated by the shape of the bill. In this species, the bill (Figure 128, compare with Figure 129) is larger, longer for its height, and of less stubby appearance. It is also of more even width with less taper towards the tip. These bill characters may not be as well-marked in all specimens as shown in the figures but are generally recognizable. For further differences see Barrow's Golden-eye, the next species.

Field Marks. In flight, Golden-eyes are large, black and white or grey and white Ducks with considerable white on wings and big, round, black, or very dark, heads in decided contrast to body. The big, round head and short, stocky neck are recognizable at a distance at which all colour distinctions are lost. The loud whistling of the wings in flight is well known and suggests one of the most common popular names. The species is not likely to be confused with any species but Barrow's Golden-eye. Males may be distinguished from Barrow's by the round instead of crescentic white face spot, when that is visible, and, on the water, by the relative amount of black and white displayed. This species, having white flank feathers normally covering the edge of the wing and more white in back and wing, appears as mostly white on the body instead of mostly black as in Barrow's Golden-eye. Juveniles and females of the two species are not to be distinguished in life with any certainty, the larger amount of white on the lesser wing coverts of this species may be suggestive at times, though Barrow's Golden-eye usually shows a darker head with a higher forehead.

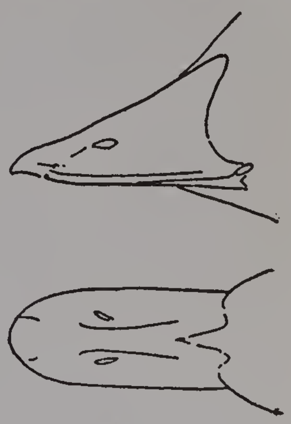


Figure 128
Bill outline of American Golden-eye; scale, ½.

Nesting. In hollow stumps or trees, or even in openings in buildings.

Distribution. The greater part of the northern hemisphere. In America across the continent, nesting as far north as suitable timber occurs.

SUBSPECIES. The New World form of this species is subspecifically separated from the Golden-eye of the Old World as the American Golden-eye *Glaucionetta clangula americana.*

The Golden-eye is one of the best-known Ducks. The shrill whistling of its wings as it whirls by the blind makes it notable to the shooter and its habit of nesting in trees and other hollows has drawn the attention of others, and suggested the misnomer, Wood Duck. Its fondness for nesting in various cavities leads at times to rather peculiar and interesting choice of locations. They sometimes come through stove-pipe or other holes into unused attics. In Camrose, Alberta, one persisted in using the chimney of a residence for its nest, until a false flue was substituted. In this case, the ducklings, when freed from the shell, scrambled in some way to the top of the chimney, and flinging themselves over the edge, rolled and bounced resiliently to the ground unhurt, there to be led away by the mother to the nearest water. In this case and in some others authentically reported of this species, the young were not assisted to the ground in any way.

"This is one of the first Ducks to come north in spring and one of the last to leave in autumn. Though sparsely common everywhere, it is not regarded as good game in the west. On the prairies it is seldom eaten, and on the coast its flesh is often unfit for food in the autumn on account of the eating of dead salmon. Although it is prolific, large flocks of the species are seldom seen."

152. **Barrow's Golden-eye.** *Glaucionetta islandica.* L, 20. Plate X B. Closely similar in all plumages to American Golden-eye.

Distinctions. For distinctions from other Ducks except the American Golden-eye, see that species, page 93. The adult male differs from the American in having purplish instead of greenish reflections to head; crescent-shaped instead of round white face spot; flank feather group edged on upper border with broad band of black, and considerably less white in wing and back pattern. Juvenile males and females can best be separated by the shape of the bill. In this species the bill (Figure 129, compare with Figure 128) is smaller, and shorter for its height, giving it a more stubby appearance. It is also of less even width with more taper towards the tip. These characteristics may not be as well marked in all specimens as shown in the figures, but are generally recognizable. In young males a less apparent difference can be found. The forehead of Barrow's Golden-eye rises abruptly from the base of the bill, where a lump can be felt under the plumage by firmly stroking the forehead with the finger. Anatomically the males of the two species can be separated even in young birds early in the autumn by the enlargement of the windpipe. In the American Golden-eye, there is an extraordinary bulbous enlargement of the windpipe between the arms of the merrythought. In Barrow's, the whole pipe is gradually enlarged along the neck, but without any suggestions of a bulb.

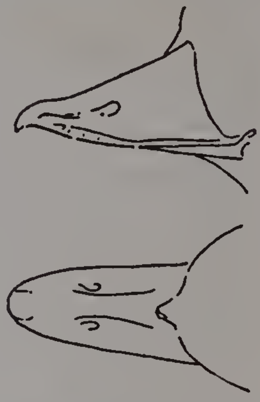


Figure 129
Bill outline of Barrow's Golden-eye; scale, ½.

Field Marks. For recognition marks as Golden-eyes, see previous species. From the American Golden-eye, it may be known by the crescent-shaped instead of oval face spot, as far as that can be seen, and at greater distance on the water, by the relative amount of black and white displayed. This species, having the flank feathers that normally cover the edge of the wing widely bordered with black, and more black in back and wing pattern, appears as mostly black on the body instead of mostly white as does the American Golden-eye. Juveniles or females can probably not be told apart in life with any certainty, though the less amount of white of the lesser wing coverts may be suggestive at times.

Nesting. In stumps or hollow trees when available, otherwise in rock cavities or on the ground.

Distribution. Northern North America. A bird of the extreme east and west, common on the gulf of St. Lawrence and through the mountains and on the coast of British Columbia, but absent in the country between.

In the west this Duck is a frequenter of the little mountain lakes near which it nests, and to which the young broods are brought as soon as they are out of the shell. Every little pool in the hills and mountain valleys in spring shows Barrow's Golden-eye bobbing and gesticulating in their courting ritual. Later the brown-headed female, with her brood of little black and white ducklings, occupies the scene, while the moulting males disport themselves elsewhere enjoying gay bachelor life. Where they disappear to at this season is not clearly known, but probably a search of the sea off the outer coasts, in summer time, would discover the missing birds.

153. **Buffle-head.** BUTTERBALL. SPIRIT DUCK. *Charitonetta albeola.* L, 14·75. A very small Duck, almost as diminutive as the Teal, but coloured in striking black and white. Male: white below and around base of neck; back black; head iridescent black, broken by large, triangular patches of pure white with apex below the eye, the base meeting its fellow across nape. The feathers of sides of head lengthened, making puffs on sides

of face, hence the name. The female is white below, blackish or greyish brown above and on head, with softly margined white cheek spot extending back towards nape. The juvenile is like the female, but the throat is a little lighter and the cheek mark partly obscured (Figure 130).

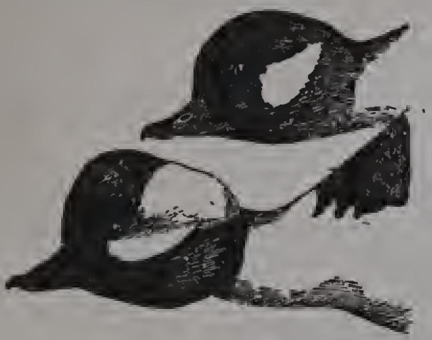


Figure 130
Buffle-head; scale, ¼.
Male. Female.

Distinctions. The very small size and white speculum. Juveniles and females are rather like comparative plumages of Scaups, but much smaller and with a light cheek patch instead of a spot at base of bill. Somewhat suggestive of female Harlequin, but continuously white below, with one instead of two face spots, and a white speculum.

Field Marks. Male with conspicuous white triangle on black head is easily recognized. This species though it has a big-headed appearance similar to the Golden-eye is so much smaller that confusion can hardly result. Females and juveniles can best be recognized by their small size, single face spot, and white underparts and speculum.

Nesting. In stumps or hollow trees.

Distribution. North America, breeds in the west throughout the prairies, and in British Columbia except the most southern parts, north through Mackenzie valley.

The name Spirit Duck is given to this little species because of its remarkable diving, and ability to disappear when injured.

"Scattered commonly throughout the west, and in autumn sometimes met with in considerable flocks, the Buffle-head is one of the incidental Ducks that come to bag without being specially sought. It is a diving Duck and rarely found upon shallow, muddy ponds. Its flesh is good inland, though on the coast often unfit for food from its habit of feeding on dead salmon."

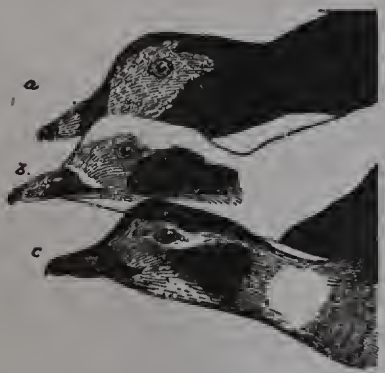


Figure 131
Old-squaw; scale, ¼.
a, male in summer.
b, male in winter.
c, female.

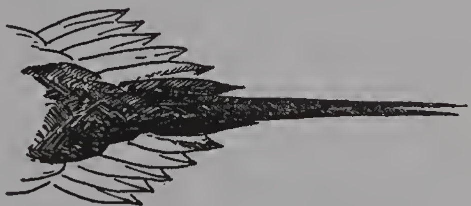


Figure 132
Tail of Old-squaw (male);
scale, ⅕.

154. **Old-squaw.** COCKAWEE. LONG-TAILED DUCK. *Clangula hyemalis.* L, 21 (Projection of two middle tail feathers beyond others 4·5-5·0). A medium-sized Duck showing a remarkable seasonal change of coloration. The adult male in spring and summer has head (Figure 131a), neck, breast, and back dark seal-brown, lower abdomen and flanks white. There is an almost white mask-like patch including the eye and rusty-ochre stripes over the wings and at base of hindneck. In winter the colours change entirely and it becomes a mostly white, instead of a mostly dark bird (Figure 131b). Head and neck white with a light grey face and a large dark and rusty-grey patch over cheeks and ears. White below, with a broad belt of dark seal-brown, nearly black, sharply defined against white base of foreneck above and abdomen below. Above, white of neck extended almost to shoulders; back black with spray of elongated pearl-grey feathers drooping from shoulders over wings. No speculum or wing marks. In both seasons the long, central

tail feathers (Figure 132) are conspicuous. There is a ring of orange or pink about the bill. The female is more obscurely coloured. Flanks and below white, with a dull breast band. Above, dark brown with lighter feather edges. Head (Figure 131c) with dark brown cap extending down back of neck. Extensive brown cheek and ear patch suffusing over throat and down foreneck, leaving face in front of the eye greyish, and sides of neck white. There is no speculum, or white of any kind, on the wings in either sex or any plumage.

Distinctions. The male with its long "sprigs" or centre tail feathers can be mistaken only for the Pintail, but its entirely different colour and decidedly chunky build make confusion unlikely.

The female is less easily characterized. In general appearance it resembles the female Harlequin or Buffle-head. Its much larger size, lack of white wing spot, and presence of white on the neck, separate it easily from the Buffle-head; its white underparts and flanks, larger amount of white on head, and white neck are distinctive from the Harlequin.

Field Marks. The long tail of the male, along with chunky build and general coloration. In winter, it is mostly white with a conspicuous black patch on the side of the head. In summer it is mostly black, or very dark, with a white mask. The female is largely white, especially on flanks and underparts, the only such Duck with solidly dark wings. The species is comparatively easy to recognize in life by these characteristics.

Nesting. On the ground, near water, hidden under bushes or grass.

Distribution. Common in winter on the coasts or Great Lakes, rare in the interior. We have only occasional records for the species from the prairie sections. Breeds on the Barren Grounds across the continent. It is regularly only a winter visitor or migrant in our southern localities, but occasional subnormal birds summer on the coast of British Columbia and the larger more northern lakes.

In the southern regions of Canada it is essentially a winter Duck and a bird of the seacoasts. It winters there in enormous flocks and is a most expert diver, sometimes being taken from fish-nets at depths of 90 feet or more. It is considered nearly worthless as a table-bird.

155. **Harlequin Duck** (Including **Western Harlequin Duck**). LORD AND LADY. ROCK DUCK. *Histrionicus histrionicus.* L, 17. Plate XI A. A small Duck, well named after particoloured Harlequin.

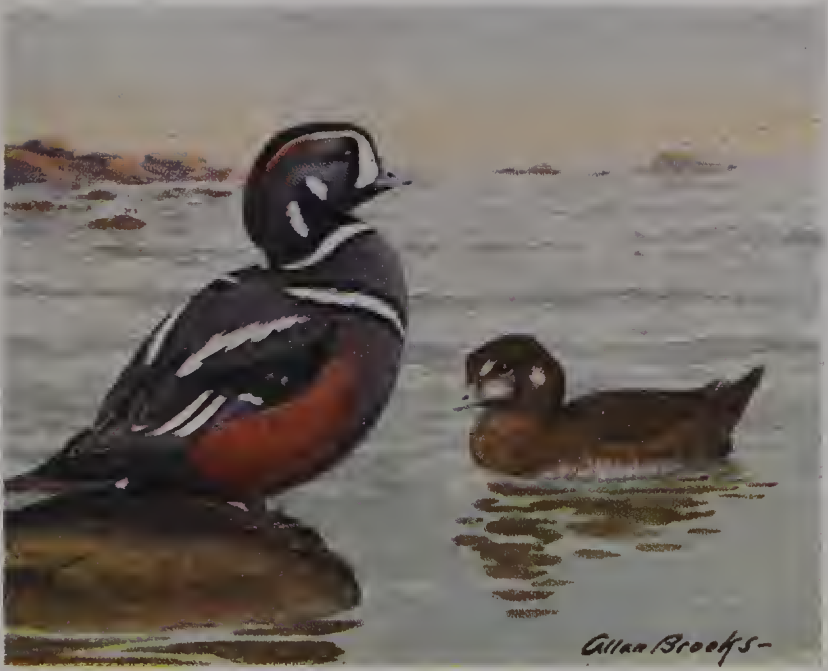
Distinctions. The male with its striking coloration is not to be confused with any other species. The female, however, is not unlike the females of several other species. Having no wing spot or speculum sets her off from all other comparable Ducks except the Old-squaw, the Surf Scoter, and the Ruddy. From the Old-squaw she can be told by the evenly dark head and neck with two, sometimes three, white spots on the sides of the head and the dark flanks and undertail coverts. From the Surf Scoter, she is distinguished in hand by very much smaller size and the more delicate, un-scoter-like bill (compare with Figure 138). From the Ruddy female she differs in having a small, narrow, instead of a large, flat, or spatulate, bill (compare with Figure 139), and the brown areas are sooty and solid without suggestion of rusty or ochraceous vermiculation on the back. There is a slight general resemblance to the female Buffle-head (Figure 130), but there is no white on the wing.

Field Marks. As far away as colour details can be made out, the male Harlequin with its sharp, contrasting white spots on a dark ground is conspicuously identifiable. The crescent just in front of the wing is visible at a great distance. The female is more easily confused, especially with the Buffle-head, the Old-squaw, and the Surf Scoter. From the Buffle-head its larger size, general darkness of underbody, two or three instead of one vague light spot on the face, and lack of white on wing when flying will differentiate under most circumstances. From the Old-squaw, which is also without wing spot, it is probably best distinguished by its dark instead of light underparts and flanks, the small amount of white on the head, and the total absence of white from the neck. The round white spot on the side of the hind head is the most conspicuous of these facial marks and has quite a different appearance from the white streak back from the eye of the female Old-squaw (Figure 131c). In coloration the female Harlequin is an almost exact small replica of the female Surf Scoter. When the great difference in size cannot be estimated, the more delicate bill and head outline is the best distinction from the heavy-billed, large-headed Scoter.

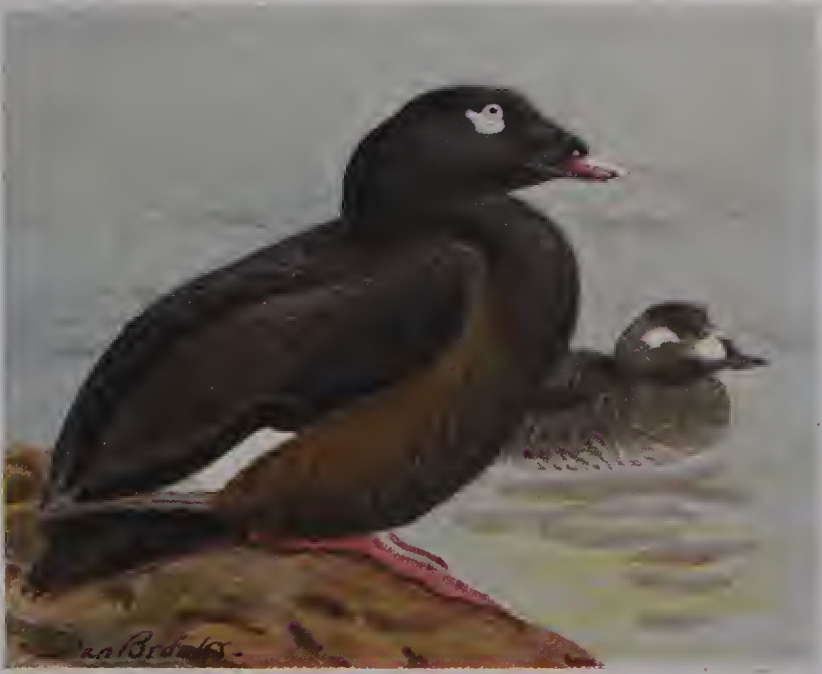
Nesting. On the ground, under rocks or driftwood or in hollow trees.

Distribution. A bird of peculiar, discontinuous distribution. Common on the northern Atlantic and the Pacific coasts and in the interior of British Columbia. Rather

Plate XI



A. Harlequin Duck; scale, $\frac{1}{6}$
Male Female



B. White-winged Scoter; scale, $\frac{1}{6}$
Male Female

scarce through Slave River and Mackenzie River valleys and never seeming to come south into the prairie sections except in the foothills closely adjacent to the mountains. It breeds in the mountain streams, probably wherever found, but is not common.

SUBSPECIES. The western American and northeastern Asian birds of this species have lately been separated from our eastern birds by small details of colour, as the Western Harlequin Duck *Histrionicus histrionicus pacificus.*

This is a bird typical of the mountain torrents. Its summer home is the brawling glacial streams that descend the mountain sides, and the little pot-hole lakes that dot the higher valleys. The female raises her young in quiet, little glacial lakes, while the male, gay Harlequin that he is, betakes himself to the seacoast, where in company with others of his sex and some unmated or bereaved females, he spends the summer off rocky shores or on the kelp beds. The beauty of these wonderful little Ducks has given them the name among prospectors and trappers of "Lord and Lady Duck," and their chosen haunts on the coast have suggested the term "Rock Duck".

EIDERS

Though not forming a recognized systematic subdivision of the Ducks, the Eiders are sufficiently similar to warrant special reference as a group in a popular work of this kind.

General Description. Large, sturdily-built birds; with the Scoters, the largest of our Ducks. Males have broad masses of contrasting black and white, with sharp secant markings, and delicate suffusions of pale nile green and wine-coloured tints. The females are coloured in even shades of brown and are notable in being more or less extensively cross-barred, in some cases completely around the body, at others mostly across breast and flanks. The bills, except of Steller's Eider, are stout, and much intruded upon by plumage at the base.

Distinctions. In size and heavy build like the Scoters, but the males have large amounts of white and the females are cross-barred in brown.

Distribution. Arctic and marine in distribution. Seldom coming down from their northern haunts, and in the west only accidentally, if ever, on fresh water.

The Eiders are notable as the source of the eiderdown of commerce. It is the under or body down plucked by the bird itself for use as nesting material. Each nest is composed of a considerable mass of warm down on which the eggs are laid and with which they are covered when the parent leaves the nest. In Iceland, small amounts of down are gathered at regular intervals during egg deposition and incubation. This is gradually replaced by the bird as long as her supply lasts, after which she is left in peace until the eggs are hatched when the remainder is also taken. After cleaning from adherent straws, grasses, and bits of moss the down is ready for sale and use. In that country land-holders have a proprietary right in the Eiders that nest on their lands. The birds are strictly protected and encouraged to nest close to the houses where they become semi-domestic in their habits and furnish a regular and appreciable source of income.

157. **Steller's Eider.** *Polysticta stelleri.* L, 17. The smallest and the least eider-like of any of the birds known under that name. Male: white, except for the following details—neck all around and back, iridescent blue-black. The head is peculiarly silvery in its whiteness, with a throat patch and spot encircling the eye of dead black. A small, dark sap-green nape crest and a suffusion of same colour in front of eye (Figure 133). Below—abdomen to tail very dark, carbonized brown suffusing up flanks and breast in a lighter burnt vinaceous tint—as though the bird had squatted on a hot plate. A group of narrow feathers striped iridescent black and white falling in curved plumes over the secondaries on the closed wing. The female is rich dark brown, with suggestion of scorching below, more or less cross-barred with lighter on upper breast, neck, and face.

Both sexes have an iridescent blue-black speculum bordered each side with white like a Mallard.

Distinctions. In the male the general coloration, especially the silvery sheen of the face and crown. In the female general dark brown colour, cross-barring on breast and face, and white-bordered blue speculum.

Field Marks. Probably, large amount of white on body, black neck and throat, and silver-white face and crown make as good field marks for adult male as can be given. Except within its natural range not to be recorded on sight identification.

Nesting. On the ground of the tundra.

Distribution. Coast of Bering sea and adjoining Arctic ocean. Occurs occasionally east to the Yukon coast, possibly beyond. More common on Siberian side of the straits.

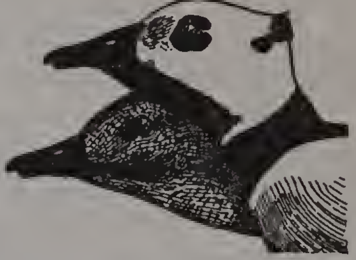


Figure 133
Steller's Eider; scale, ½.
Female Male

A distinctively beautiful bird to be expected in Canada only along the extreme western Arctic coast or as a possible rare straggler on the Pacific.

158. **Spectacled Eider.** *Arctonetta fischeri.* L, 21. A larger bird than Steller's, but smaller than any of the other Eiders. Below—beginning sharply at base of white neck dark slate grey, shading to dark brown on abdomen and flanks. Above—largely white with spray of stiff, curved white feathers falling over closed secondaries. Head with yellow bill, white throat, sea-green cheeks, a hanging crest of stiff nile-green feathers on sides of nape. In front of eyes a spot of sap-green feathers of peculiar texture, resembling deep-piled velvet. The most striking feature of the face, however, is a circle of soft silvery white feathers about the eye, sharply bordered by a thin line of black that suggests the name "Spectacled" (Figure 134). The female is light brown, darker above, with broken dark and rusty bars across breast, flanks, and on back. The head is light and finely streaked.

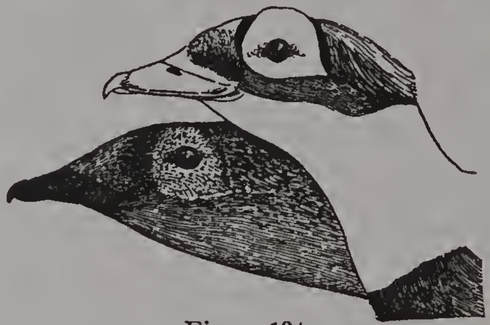


Figure 134
Spectacled Eider; scale, ½.
Female Male

Distinctions. The coloration and spectacles of the male are unmistakable. The female is easily recognized as an Eider by its cross-barring, and as this species by the peculiar circle of finely marked and velvety plumage about the eye, the equivalent of the similarly situated white eye spot of the male.

Field Marks. The white body and head, with dull, but not black, crown, and conspicuous white eye spot, should be recognizable at considerable distance. Females are probably not recognizable in life except under exceptional circumstances.

Nesting. On the ground of the tundras.

Distribution. Coast of Bering sea and adjoining Arctic coasts. Regularly occurring in Canada only on the Yukon coast and the mouth of Mackenzie river, perhaps straggling farther east.

A very beautiful but locally distributed Eider that is to be expected only as a rare straggler away from the western Arctic coast.

161. **Pacific Eider.** *Somateria v-nigra.* L, 24. A large Eider. White above, black below, the latter cutting squarely and sharply against a white breast delicately tinted with vinaceous. Neck, throat, and cheeks, pure white; jet black cap extending to below eyes, split over the hind head by a wedge of white, nape washed with delicate nile green

that fades gradually away into cheeks and under eyes (Figure 135). Female: light brown, cross-barred on breast, flanks, and much of back with dark, cream, and light rusty-ochre, crown and face finely streaked with dark.

Distinctions. The male likely to be confused only with the Eastern Eider. To be distinguished from it by a black V with apex on throat under the gape and arms extending under cheeks. The eastern Eider, however, is not known to occur west of Hudson bay. The female resembles the female King Eider, but may always be distinguished from it by the feathering of the sides of the bill extending as far as the nostrils (compare with Figure 136). From the eastern American Eider, the species can be told by the shape of the long bill processes. In the Pacific Eider these long, fleshy extrusions are generally thinner, narrower, and sharper and extend up the top of the forehead instead of slightly along the sides.

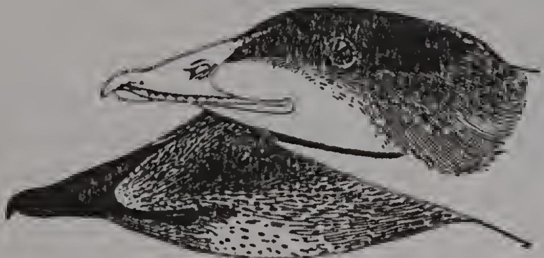


Figure 135
Pacific Eider; scale, ¼.
Female Male

Field Marks. White back, and head, with black cap, probably make the best field marks.

Nesting. On the ground of the tundra.

Distribution. The western Arctic coast and islands from Coronation gulf to shores of Bering sea. Occasional on lower Mackenzie and Great Slave lake. One record from lake Manitoba and reported from Washington coast. To be expected on inland waters or on our west coast only as a straggler.

The largest of the Eiders and to be looked for as an occasional winter visitor on the outer British Columbia coast.

162. **King Eider.** *Somateria spectabilis.* L, 23. A large Eider. Adult male: black below and mostly black on body above. Foreparts all white to head, the white falling like a cape over shoulders, narrowing to a point between the wings where it is sharply demarcated, and cutting sharply straight across lower breast, where it is tinged with warm vinaceous, against the black underparts. Wing coverts, and a conspicuous spot on either side at the base of the tail, white. The head is very distinctive. The base of the bill on either side rises in high, broad, fleshy processes, coloured orange-yellow in life, and bordered by a narrow line of black velvety feathers. The cheeks are flushed with delicate nile green and the crown is chalky blue. The throat is marked with a black V, the apex being under the bill and the arms extending under the line of the cheek feathers (Figure 136). The female is similar to the female of the Pacific Eider, light brown, more or less finely streaked on head and neck and coarsely V-marked with dark and light on breast, back, and flanks.

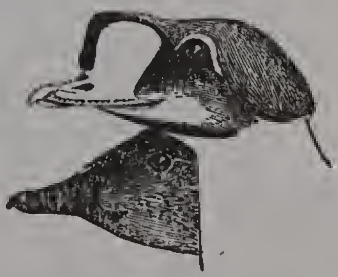


Figure 136
King Eider; scale, ¼.
Female Male

Distinctions. The adult male in breeding plumage is unmistakable with his great yellow bill processes and general coloration. The juvenile and the female are so like parallel plumages of the Pacific Eider that the bill feathering is probably the only reliable distinction. In the King Eider the featheration on the sides of the bill does not extend nearly as far as the nostrils (compare Figure 136 with 135).

Field Marks. The breeding male with its bright yellow bill processes can be recognized at long range. When this cannot be seen, the largely black, instead of largely white, back should distinguish it from any other Eider with which it might be confused. Females and juveniles can probably be recognized only when in hand.

Nesting. On the ground of the tundras, or under driftwood on the seashore.

Distribution. Northern parts of both hemispheres. Breeds along our whole northern coast and the islands north of them. We have no records for the western interior or the west coast.

Scoters

The Scoters, comprising the genus *Oidemia*, are large, heavily-built birds, and with the Eiders the largest of our Ducks. Males are solid black with only small spots of white. The bills are swollen at the base and highly coloured. The females are coloured in heavy masses of dark brown or nearly black, without distinct pattern.

Distinctions. The males are the only Ducks approaching solid black or with the peculiarly swollen bills (Figures 137 and 138). The females are the only solidly, dark-coloured Ducks without definite pattern.

Distribution. Northern parts of both hemispheres.

Scoters are expert divers and feed largely on shells and crustaceans. In the summer, large flocks of males and non-breeding females gather in the middle of the larger waters and on the seacoast in the kelp beds. They seem to get most of their food from the bottom, even in water of considerable depth.

163. **American Scoter.** BLACK SEA COOT. BUTTER-NOSED SCOTER. *Oidemia americana.* L, 19. Adult male: solid coal black with base of bill swollen and coloured bright yellow. Female: brown, lightening on throat, cheeks, and abdomen and with a rather sharply-defined dark cap (Figure 137).

Distinctions. The solid black plumage of the male, unrelieved by any colour, and the yellow bill enlargement are very distincive. The female resembles the female Surf Scoter very closely. The light colour on the face is more evenly distributed and not broken into patches as is usually the case in the latter species. The most reliable distinction seems to be the bill. In the female American, the forehead feathering does not extend down the culmen as it does in the Surf Scoter (compare Figures 137 with 138).

Field Marks. This is the smallest of the Scoters. The solid blackness of the male, with yellow "Butter-bill", are very distinctive. Both sexes show silvery on the under surface of the primaries in flight, but females looking solid black in the distance or against the sky may not always be separable from the Surf Scoter in life. The absence of white wing patches will always separate this species and the Surf Scoter from the White-winged.

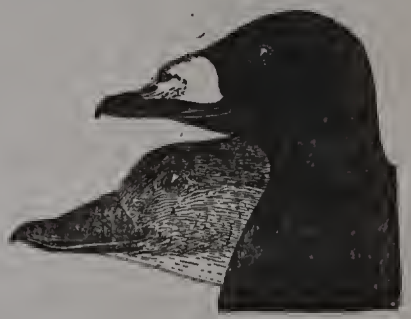


Figure 137
American Scoter; scale, ¼.
Female Male

Nesting. On the ground near water.

Distribution. Across the continent, more common on the coasts than in the interior. Breeds in northeastern Asia and northwestern Alaska. Nesting in Canada but little known, recorded from the west shore of Hudson bay.

165. **White-winged Scoter** (Including **Dixon's White-winged Scoter**). *Oidemia deglandi.* L, 22. Plate XI B.

Distinctions. Always easily recognizable in any plumage by the even black or dark coloration and the large white wing patch.

Field Marks. In any plumage, a large, black, heavily-built Duck with pronounced white wing patches.

Nesting. On the ground, under or among bushes, sometimes in the woods a long way from water.

Distribution. Across the continent. Breeding on the prairies northward. Though a common migrant and summering in large numbers off the coast we have no breeding records for British Columbia.

SUBSPECIES. The White-winged Scoter of the Mackenzie and Alaska, probably inclusive of those of the west coast and perhaps of the prairie interior, has lately been separated as a subspecies, Dixon's White-winged Scoter *Oidemia deglandi dixoni.* The points of differentiation are too fine and uncertain for popular recognition.

This is the commonest Scoter throughout the southern parts of western Canada. Though it breeds on the prairies from the southern boundary northward it is still an interesting problem where the vast numbers of Scoters that frequent the British Columbia coast at all seasons build their nests. Much more information is desired on this point.

166. **Surf Scoter.** BOTTLE-NOSED DIVER. SKUNK-HEAD. *Oidemia perspicillata.* L, 20. Adult male: an all-black Scoter with greatly swollen, highly-coloured bill and two sharply-defined triangular white patches on head; one on the forehead, the other on nape and back of neck (Figure 138).

Female: light brown, lightening on cheeks and below, and a more or less well-defined dark cap.

Distinctions. The male with its solid blackness and two white head patches is easily recognized. The bill is unique. The base is much swollen at the sides behind the nostrils, and on this extruded surface is a sharply-defined, irregular spot of black surrounded with white which shades into yellow towards the tip and into red on the culmen.

The female resembles the female American Scoter except that the lightness of the cheeks is usually broken into two vague spots. The best characteristic for separation of any plumage of the Surf from the American Scoter is the featheration of bill; the feathers of crown extending a considerable distance down the culmen instead of cutting off squarely at the forehead (compare Figure 138 with 137).

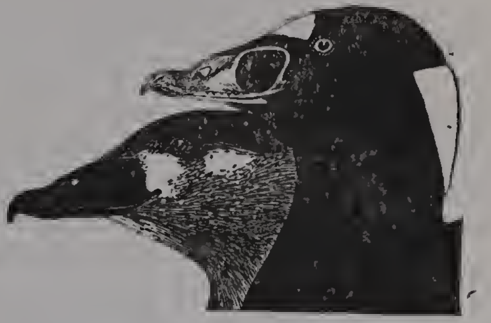


Figure 138
Surf Scoter; scale, ¼.
Female Male

Field Marks. Under some conditions, rather difficult to distinguish from the American Scoter. The lack of white wing spots separates it easily from the White-winged. The peculiar bill coloration and the white spots on forehead and nape are distinguishable at a considerable distance. The nape spot, however, is not permanent; the white feathers composing it are shed at times, leaving an area of black down in its place, discernible on close examination from the surrounding blackness by its velvety texture.

The female is probably not separable under ordinary conditions from the female American Scoter. The species is, however, identifiable in flight by the loud whistling made by its wings, audible at times when in flock for half a mile or more.

Nesting. In grass, near water.

Distribution. Across the continent, more common on the seacoasts than inland. Apparently it nests in the forest area north of the prairies in Mackenzie and Alaska, but substantiated breeding records are few, and there are none at all for British Columbia. Like some other Ducks it is often present in large numbers throughout the summer, off Vancouver Island coast where thousands may be seen, without signs of nesting. This is an excellent example of presence in nesting season being insufficient evidence for breeding records.

167. **Ruddy Duck.** *Erismatura jamaicensis.* L, 15. A rather small Duck. Breeding male: rufous-chestnut on flanks, back, and neck. Below, white with a peculiar grebe-like silvery sheen vaguely cross-barred with brown, becoming more pronounced on the breast. The crown is covered with a black cap and the face and chin are pure white. The bill is a bright sky blue (Figure 139). The bill colour fades after breeding season, but the vestiges of the ruddy breast persist through the autumn. The female is a brownish bird, lighter below, with the same silvery sheen as the male. The cap is brown and the face with a vague light spot broken by a faint dark streak from the gape back over the ears.

Distinctions. The red male with contrasting black and white head is very distinctive. The female is in plain browns without sharply characterized markings anywhere. She closely resembles the female Buffle-head, but has no white wing spot, is not as white below, and the face mark is less distinct and of different pattern (*See* Figure 130, page 95). She has an even closer resemblance to the female Harlequin, but with different face pattern (*See*

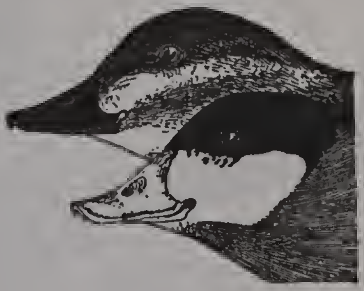


Figure 139
Ruddy Duck; scale, ¼.
Female Male

Plate XI A), and the back has a very fine pepper-and-salt, or semi-vermiculated, effect, with minute specks of rufous and ochre. The Ruddy can be separated in all plumages from any other Duck by the distinctively dense plumage below, with its grebe-like sheen, the tail of stiff, spike-like feathers, and the broad, short bill with peculiar hook to the nail.

Field Marks. The red back, black cap, or white face patch of the male can be recognized at long distance. The round, chunky body, the short thick neck, and the habit of carrying the tail spread star-like over the back are also characteristic. The general chunky outline is probably the best recognition mark for the female in life.

Nesting. In reeds, over water.

Distribution. Across the continent. Breeding in the prairies and southern British Columbia northward.

The Ruddy Duck is a unique little bird and does not seem very closely related to the other Ducks. In the breeding season it is amusing to watch the male as he bustles importantly about his dull-coloured mate, cutting rippled circles on the water, bobbing and bowing, the erect, spread tail making him look still dumpier and shorter.

"The Ruddy Duck is not hunted anywhere in the west. It is seldom found in the shallow sloughs and as it is not given to making flights, it can usually be shot only on the water."

Subfamily—Anserinae. Geese

General Description. Geese resemble Ducks, but are larger with a less flattened body and comparatively longer legs; bill (Figures 140-143) is higher and generally somewhat narrower at base, stouter and less flattened at tip, hardly to be termed spatulate but with the broad nail at tip characteristic of the order.

Field Marks. The strong flight of the Geese is familiar to most people. Size, coloration, and flight habits are the best field guides. All the dark-coloured Geese in flying straight away from the observer show a conspicuous white V on the rump, the apex behind.

Nesting. Generally on the ground.

Distribution. Geese are of world-wide distribution. All American species but one breed well to the north, migrating through the interior as well as along the coasts.

The Geese are more terrestrial and herbivorous than the Ducks, but they are equally at home on the water. They do not normally dive, but secure food from the bottom by tipping and, by means of their long necks, reach considerable depths. The sexes are alike and there is little seasonal change of plumage. Geese are excellent table-birds and for this reason and on account of their superior size they are much sought after by sportsmen. Geese are exceedingly wary and although they take better care to avoid danger than many other large game birds, their former numbers have been greatly reduced.

169. **Snow Goose** (Including **Lesser Snow Goose**). WAVEY. WAVEY GOOSE. *Chen hyperboreus.* L, 23. Plate XII A. A medium-sized white Goose with black primaries. Juveniles have variable admixture and clouding of greyish brown on wings, back, head, and neck. Red rust stains from iron-impregnated water are very common on various parts of the plumage and in some birds the whole head is largely red with this adventitious colouring.

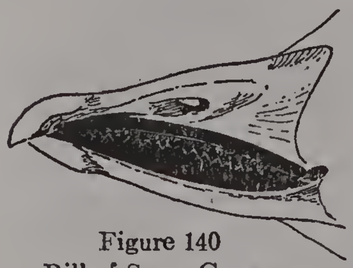
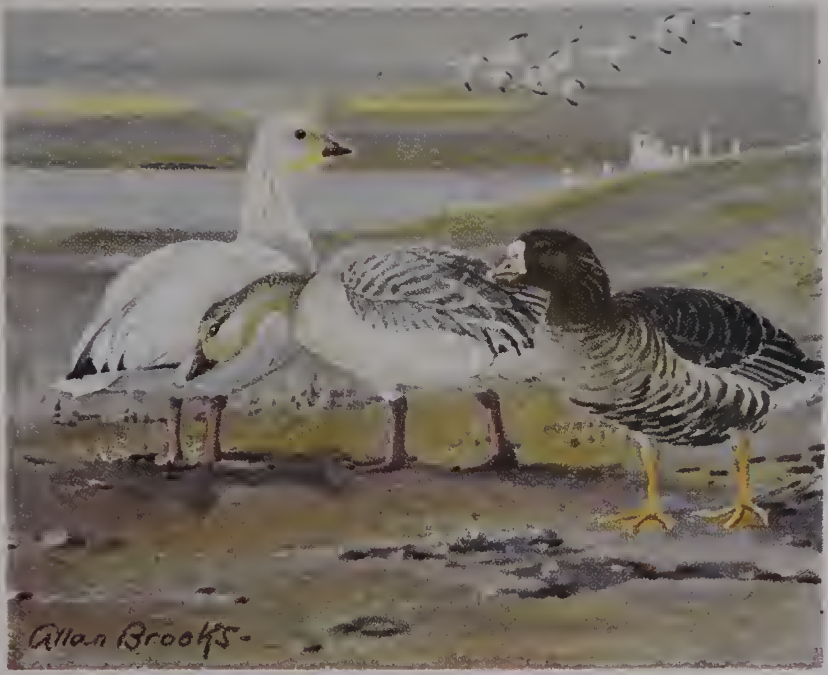


Figure 140
Bill of Snow Goose;
scale, ½.

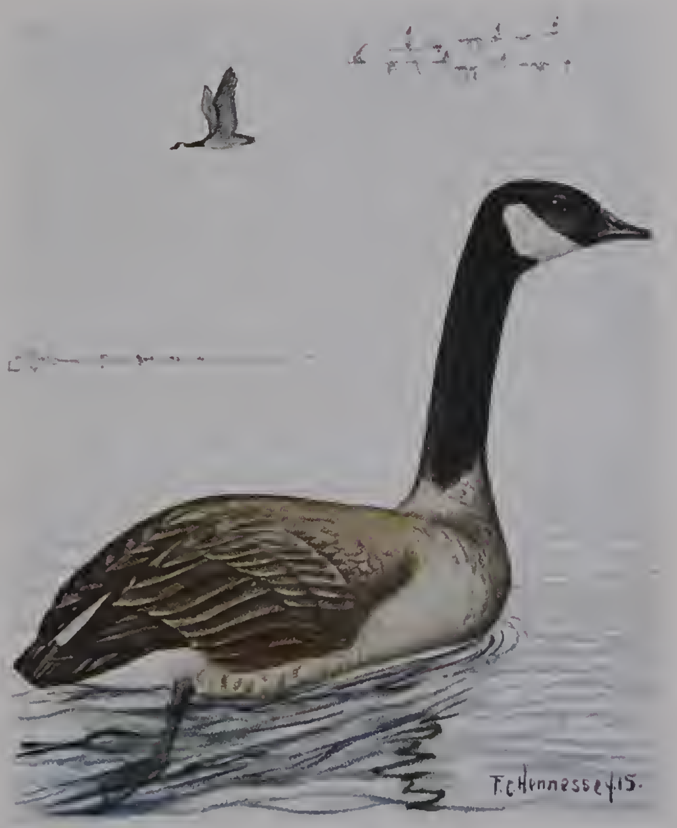
Distinctions. Easily recognized as a Goose. To be mistaken only for Ross's Goose, which is exactly similar in plumage, but only about half the bulk and only slightly larger than a big Mallard. The bill of the Snow Goose is red like that of Ross's but smoother, without rugosity about the base, and the cutting edges are widely bordered with black bands forming a "grinning patch" (Figure 140, compare with 141-143).

Field Marks. Large white Geese with black wing tips. Can be told from Ross's by size. The voice is said to be readily distinguishable also. It is very noisy in flight, whereas Ross's usually flies silently.

Plate XII



A. Snow Goose; scale, $\frac{1}{14}$ White-fronted Goose; scale, $\frac{1}{14}$
Adult Juvenile Adult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B. Canada Goose; scale, $\frac{1}{8}$

Nesting. On the ground.

Distribution. Breeds on the islands and mainland of the American Arctic, migrates down through the interior and along the coasts, mostly west of the Great Lakes.

SUBSPECIES. The subspecies of Wavey common to the west is the Lesser Snow Goose *Chen hyperboreus hyperboreus,* the type form. The eastern race, the Greater Snow Goose *Chen hyperboreus nivalis,* has been reported from the west, but without satisfactory evidence. The two differ only in size and so slightly and with so much individual variation that some doubt has been expressed as to the validity of the subspecific difference. As far as is known, the only flock of Greater Snow Geese extant winter off the Carolina coast and visit St. Lawrence river near Quebec on migration. Their breeding ground is unknown, but it is probably in the eastern Arctic islands or northern Greenland. The probability of these birds ever occurring west of the Great Lakes is very slight. One source of confusion to the general public may be the occurrence of Ross's Goose which seems to fulfil the requirements demanded by the name "Lesser", leaving the term "Greater" to be applied to the next larger, common white Goose, the real Lesser. However, birds presumed on geographical grounds to be Lesser Snow Geese occur in sizes that agree well with dimensions for the Greater.

The name Wavey is a corruption of the Indian word "Wa-wa," meaning Wild Goose, and is the common name for the Snow Goose throughout the west. The Snow Goose migrates down through the prairies in immense numbers, turning the lakes and fields upon which it settles white as with snow. En route, the great flocks were formerly taken toll of by the Hudson's Bay Company's posts and the inhabitants of the northern unorganized territories, who killed large numbers to salt for winter use. Even under this great drain, their numbers did not seem to diminish as did those of other species. When they reach civilization, where they are actively hunted, they are so wary that few large bags are made within our territory.

Some twenty years ago when seed was generally sown broadcast, the large flocks caused occasional serious damage and sometimes necessitated the replanting of crops. Settling on the newly sown fields the flocks progressed across them like drifting snow, the rear birds constantly passing over their fellows in front and leaving the ground clean of seed behind. Such immense flocks are seldom seen today, and present methods of drilling grain in would prevent damage from them, as Geese do not scratch as do chickens or grouse. Snow Geese are erratic in their choice of feeding grounds and seldom return to the same fields. It is because of this habit, and their extreme wariness that methods suitable for hunting the larger Canada Geese mostly fail when used against this species.

169. 1. **Blue Goose.** *Chen caerulescens.* L, 26. About the size of the Snow and the White-fronted Geese, but body slaty-grey and brown, wave-marked with lighter feather edges on back and below. Wings and rump mostly slate colour; head and neck solid white. Juvenile is similar, but head and neck entirely brown. The bill is almost identical with that of the Snow Goose (*See* Figure 140).

Distinctions. The combination of white head and neck with darker body does not occur in any other American Goose except the Emperor Goose, but that species has a broad, sharply-defined band of black along the throat and foreneck, and is so widely separated in range from the Blue, that confusion is very unlikely. The brown-headed juvenile is very similar to the young White-fronted Goose, but has pink instead of yellow legs and feet.

Field Marks. The white head and neck and dark body can be distinguished at a great distance. Except for the flesh-coloured instead of yellow legs and feet, the juvenile can hardly be told by eyesight observation from the young White-fronted Goose.

Nesting. Unknown.

Distribution. A bird of peculiar and puzzling distribution. Its nesting ground is yet to be discovered. It migrates in great numbers along the east coast of Hudson bay and winters on the gulf of Mexico. Between these stations we know of only occasional occurrences of the species and it must make its migratory journeys by long-sustained flights.

About the only place in settled Canada where it seems of regular occurrence in appreciable numbers is central Manitoba. Here flocks of a few hundreds, only a small fraction of the total specific numbers, however, are seen each spring. Elsewhere in Canada it is but an erratic straggler. The distribution and migration of this species are among the problems of American ornithology.

The Blue Goose in habit is so like the Snow Goose with which it often associates that, for a long time, it was regarded as the young of that species.

170. **Ross's Goose.** SCABBY-NOSED GOOSE. *Chen rossi.* L, 21. A small Wavey Goose, hardly larger than a big Mallard.

Distinctions. Likely to be confused only with the Snow Goose. Besides its decidedly inferior size, Ross's Goose lacks the black "grinning patch" of the Snow Goose, and the base of the bill in well-grown specimens is rugose and bluish, suggesting the popular name of "Scabby-nose" (Figure 141, compare with 140).

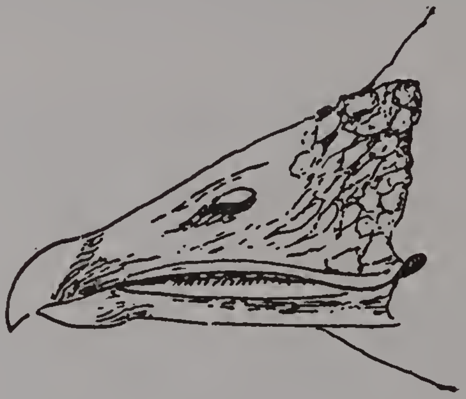


Figure 141
Bill of Ross's Goose; natural size.

Field Marks. A very small white Goose with black wing tips. In flight it is not as noisy as the Snow Goose.

Nesting. Unknown.

Distribution. Another Goose of interesting and problematical distribution. In the spring it passes in large numbers through the large lakes of Mackenzie and vanishes towards the north. On the southward migration it comes down through the more western prairies and crosses the mountains of central Montana to the California coast. It occurs in British Columbia or Manitoba only as a straggler.

The general similarity of this species to the Snow Goose, and its small size, had probably suggested its identity with the Lesser Snow Goose and caused that species to be regarded as the Greater, an incorrect but rather natural conclusion for the non-technical observer.

171. **White-fronted Goose** (Including **American White-fronted Goose).** SPECKLED-BELLY. *Anser albifrons.* L, 27. Plate XII A. A medium-sized Goose, greyish-brown, with a white patch at base of bill and speckled or irregularly black-spotted underparts.

Distinctions. The greyish-brown body, brown head and neck, white forehead and bill patch, irregularly pied underparts, and yellow legs and feet make very distinctive characters for the adult. The juvenile is similar only to the young of the much rarer Blue Goose, but has yellow instead of pink feet and lacks the broad grinning patch characteristic of that species and the Snow Goose (Figure 142, compare with 140). The irregular blotching of black on the underparts may be almost or quite absent on young birds, but traces at least of the white face mark appear in most autumn birds.

Field Marks. A dark Goose. Neck evenly brown with the body; without the cheek marks of the Canada Goose, but with a white patch surrounding the base of the bill. Legs yellow or orange. These marks can be seen on the adult at long range. The young bird when the usual white face patch is inconspicuous may be confused only with the juvenile Blue Goose which is generally too rare to be often considered.

Nesting. On the ground of the tundra.

Distribution. The northern hemisphere, in the New World, central and western North America; breeding on the Arctic coast and islands and migrating through the prairies and along the west coast. Rarer in the interior of British Columbia.

SUBSPECIES. The American White-fronted Goose *Anser albifrons gambeli* has been supposed to be the New World form of the representative species. Lately, however, it has been demonstrated that both the large American White-fronted Goose *Anser albifrons gambeli* and the smaller, typical, European form *Anser albifrons albifrons* occur in America, but that the former is much the scarcer. Limited numbers of them have been found wintering in California under the local name "Tule Geese", but most other specimens from this continent, and all Canadian specimens that have been so far examined, prove to be of the smaller race that has been heretofore considered as confined to the Old World. The larger birds undoubtedly pass through on migration, but so far Canadian specimens have not been brought to scientific notice.

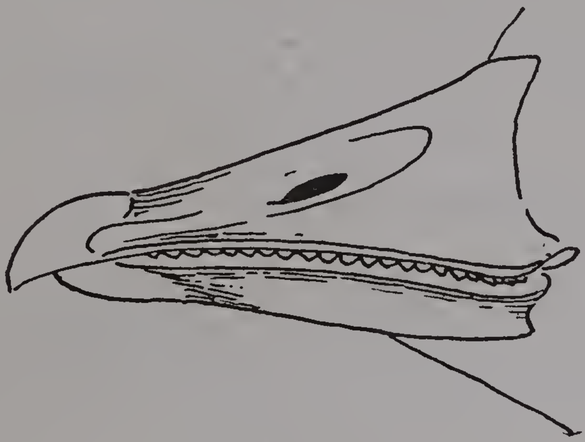


Figure 142
Bill of White-fronted Goose; natural size.

In certain sections of the prairie provinces this Goose is popularly called "Brant." This is an unjustifiable misuse of a name otherwise applied, and has been the source of much confusion. (*See* under Brant, page 109.)

172. **Canada Goose** (Including **Hutchins's, Cackling,** and **White-cheeked Geese**). HONKER. GREY GOOSE. CALLING GOOSE. *Branta canadensis.* L, 23-39. Plate XII B. A grey-brown Goose, usually lighter below, somewhat wave-marked with lighter feather edges. Head and neck black with white cheek patches. In size it is variable and may be as small as a large Mallard weighing less than 4 pounds, whereas the record for size is 18 pounds. Underparts may be nearly white or as dark as the back. The cheek spots may or may not be joined together under the chin and there may be a narrow white collar at the base of the black neck or "stocking". There is very little difference in plumage with sex or age.

Distinctions. This highly variable species may always be recognized by its black head and neck, the so-called stocking, which stops abruptly at the shoulders, and by the conspicuous white cheek patches. It can be confused with no other species at present recognized.

Field Marks. The black stocking, white cheek patches, and the sonorous and well-known honk are the best of field marks.

Nesting. On the ground in the grass, on hummocks and elevations like old hay-cocks, or occasionally in deserted Hawk's nests in the tops of tall trees.

Distribution. Across the continent, migrating commonly everywhere in the interior and on the coast. Breeding in the west from south of our boundary, indefinitely northward.

SUBSPECIES. Although few birds are as well known to the sportsman and general public, none is so little understood systematically by either scientist or layman. It is a variable species and is divided into four recognized geographical races, but in spite of all the birds that have been killed and casually examined by shooters, we have not enough specimens in our museum to define the ranges of the various forms, to determine the real characters of the races, or even to agree unanimously upon the varieties and the degrees of their relationship with each other. One reason is that sportsmen have not been accurate enough naturalists and the naturalists have not been good enough sportsmen, to decide the question unassisted. These birds often show differences in life that are obscure in specimens and *vice versa*. Naturalists have somewhat neglected the larger water birds under an impression that they have already been exhaustively studied. Sportsmen, intent on circumventing a few desirable species, have seldom been interested in any characters and habits that are not accessory to that end. They have largely limited their data to their own experience and often fail to appreciate problems that are raised by a wider and broader outlook. The sportsman and the naturalist each sees much that the other misses, but it is seldom that the two are brought together to supplement each other. Even with such a well-known bird as the Canada Goose, there is still a conflict of authority as to whether it is a single or a composite species and as to the inter-relationship of the various postulated races. The American Ornithologists' Union Check-list recognizes only one species from the minute Cackling Goose to the big Honker, the Canada Goose proper. According to that authority we have four subspecies occurring in the west, all practically alike as far as colour goes and differing only in size. As there is considerable individual variation in size, and many intermediate specimens, the difficulty of separating the races is very great. They are perhaps more easily distinguished in life than in specimen. The voice is especially distinctive, deep and full in the Honker, higher in Hutchins's, and quite shrill in the Cackling. This may be but another expression of size. The vocal organs of such birds are similar to horns. The larger the bird the longer the horn and the deeper the note, and the ear seems more capable of noting small differences of pitch than the eye is of

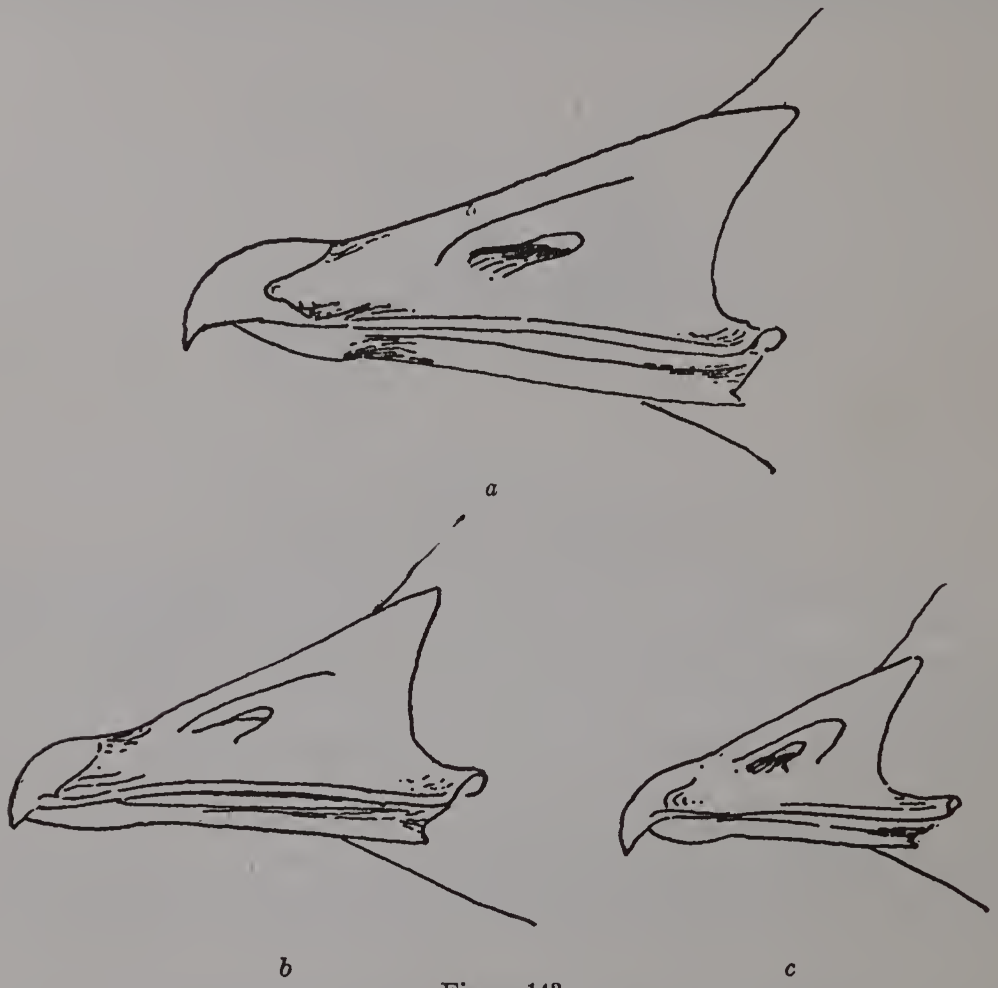


Figure 143

Bills of the subspecies of Canada Geese; natural size.

a, Honker; *b*, Hutchins's; *c*, Cackling.

noting those of size. The ear, therefore, may make a better distinction in this case than the eye.

Various slight colour differences between individuals can be detected. The cheek patches may or may not meet across the throat and there may be a more or less complete white collar around the neck at the bottom of the black stocking. These variations may occur in any form, but seem rather more common in birds of the west than of the east. The only colour distinction that seems to have connexion with distribution is the depth of colour of the underparts. Eastern and interior birds have light fawn or almost cream-coloured breasts and abdomen. Those of the west coast are likely to be deep mouse colour. This seems to be the most distinctive character of the White-cheeked Goose, the only one that is appreciably differentiated by colour. This dark coloration seems to have been transferred to west coast Hutchins's Geese through interbreeding with the dark-breasted White-cheeked and the Cackling. The following are the subspecies of Canada Geese as at present recognized.

Canada Goose. GRAY GOOSE. HONKER

Branta canadensis canadensis. The largest of the American Geese, weighing up to 12 to 14 pounds or even more. Wing 15·70 to 20. Bill 1·9 to 2·3 (Figure 143a). The black stocking is long and extends down to the base of the neck, in Hutchins's it is shorter. The Honker is perhaps best recognized by its deep sonorous voice. Its range extends across the continent, from coast to coast. West of the Great Lakes it breeds from south of the International Boundary north probably to the limit of trees.

This is one of the most highly prized game birds of western Canada. It is the wisest and wariest of birds and the goose hunter has need of all his wiles in its pursuit.

Hutchins's Goose. CALLING GOOSE. SHORT-NECKED GOOSE, and numerous other names of local usage

Branta canadensis hutchinsi. Wing 13·15 to 17·25. Bill 1·25 to 1·7 (Figure 143b). Next in size to the Honker, but much smaller; the same colour with the exception of perhaps a shorter black stocking. In life, it is best told probably by its voice which is higher and sharper, and experienced shooters can recognize it at great distances. In the interior of British Columbia and on the prairies it is likely to be confused only with the Honker. It does not associate regularly with its big relative, neither will the latter decoy well to captive Hutchins's Geese. This may be merely a demonstration of the clannish nature of the species, but it is suggestive of the idea that the apparently slight difference between them may be more fundamental than would be gathered from an examination of specimens. Hutchins's Goose breeds west of Hudson bay from the Barren-grounds indefinitely through the Arctic islands northward, and migrates down the west coast and through the interior west of the Great Lakes. On the west coast it intergrades with the Cackling Goose and the White-cheeked as well as the Honker, and many puzzling specimens may be taken there.

In all races of the Canada Goose there is great individual variation in size. They are long-lived birds and increase appreciably in size for many years. On the other hand, occasional diminutive runt-like birds occur. Such very small birds, scarcely larger than large Mallards, have been the basis of prairie records of Cackling Geese. Inasmuch as any of these birds that have been carefully examined have tarsus and toes of nearly equal length, and it is known that they breed as far east as the mouth of Hudson bay, far removed from any likely breeding ground of the

Cackling, it does not seem that this identification is justified; therefore, it is better to accept them for the present as small *hutchinsi.*

Hutchins's is the common Goose in the hunting season on the prairies, and takes second place only to the Honker, the larger size of which gives it the preference.

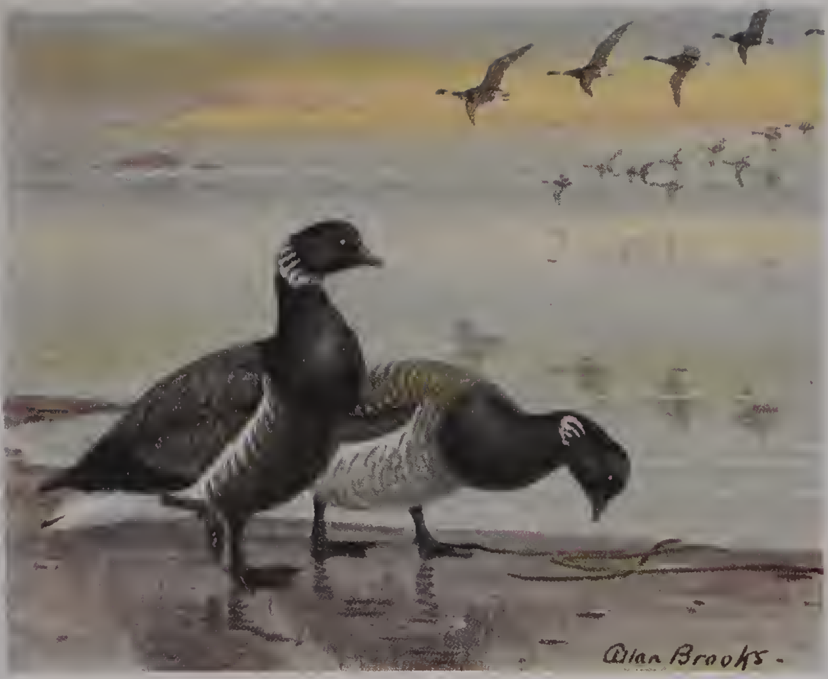
Cackling Goose

Branta canadensis minima. The smallest of the Canada Geese, at times scarcely larger than a large Mallard: wing, 13·27 to 16·60; bill, 1·01 to 1·44 (Figure 143c). In colour like the preceding, but usually with dark mouse-coloured underparts. The most distinctive character, however, seems to be that the tarsus is slightly longer than the middle toe and claw. The voice is still higher and sharper than that of Hutchins's Goose, of a quality that has suggested the name "Cackling" and the local name of "Squealer" in California. The Cackling Goose is a west-coast bird. Its breeding range is not very well known, but thought to be in western Alaska near the Bering seacoast. It migrates mostly down the coast, but also in smaller numbers through the interior west of the mounains, and winters south of British Columbia.

White-cheeked Goose. WESTERN CANADA GOOSE

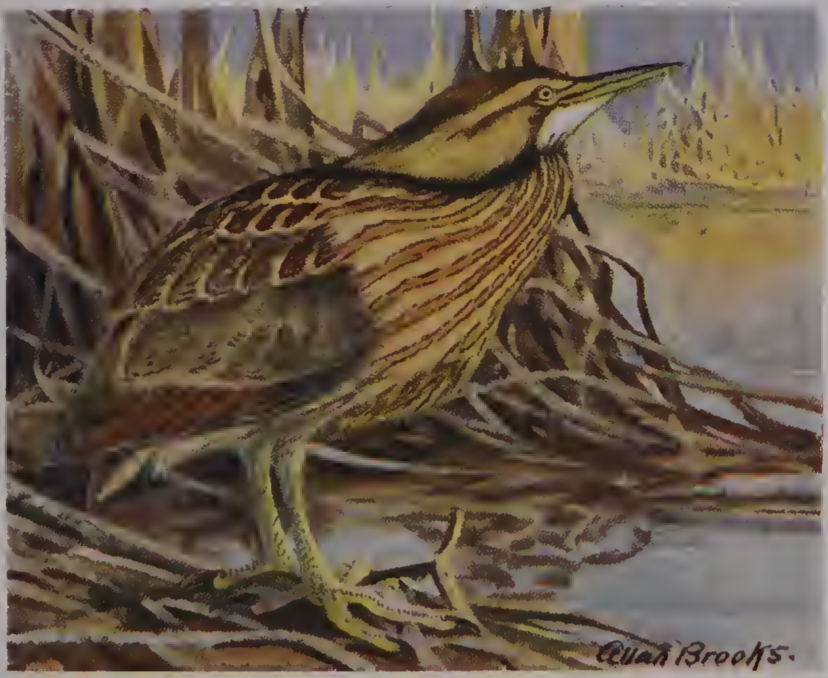
Branta canadensis occidentalis. As large as the Honker. Originally described from a more or less abnormal bird and was supposed to be distinguished by a white collar at base of stocking and the intrusion of the black throat between the cheek patches. These characteristics, however, are found to be of casual occurrence in the other forms, though more common in western than in the eastern birds, and the only distinguishing characteristic it seems to have is its large size together with very dark mouse-coloured underparts. The damp west coast has a tendency to develop heavy, dark colours in its birds. This darkening in colour does not occur in so marked a degree in Geese away from the coast. The White-cheeked Goose breeds along the coast from the Queen Charlotte islands to Prince William sound, Alaska. Along the British Columbia coast we find the greatest mixtures of plumage among the migrant Geese. All four Canada Goose races occur here in varying degree of characterization and specimens occur that may be referred to two or more subspecies without decided leaning towards any one in particular.

The Canada Goose as a species is a watchful and a wary bird, usually spending the day well out on open water or in marshes, coming in at night to feed on the fields and stubble. While so engaged, there is always one long neck upstretched to survey the surroundings, and unobserved approach by the most expert stalker is next to impossible. On this account it has probably suffered less from hunters than some other members of its family, although its original numbers have been reduced. So long as its remaining breeding-grounds in the far north remain uninvaded, and it is not seriously disturbed on its southern winter feeding stations, there is little danger of its extermination. In spite of this satisfactory condition of the species as a whole, the existence of the most desirable and interesting form of all, the Honker, is threatened, especially in the west. This fine bird breeding on the prairies in the midst of cultivation is particularly exposed to the destructive influence of civilization and at the present rate of decrease it will be but a few years before we will speak of it as a prairie breeder in the past tense only. How far north these conditions will eventually extend there is no way to foretell, but the more optimistic we are for the future and expansion of the Dominion, the greater is the warrant for pessimism. Until we have a resident population that will permit of such a fine bird as this living, nesting, and raising its young in unmolested proximity, the future of the Honker on the prairies is far from secure.


Allan Brooks.

A. Brant; scale, $\frac{1}{10}$

Black Brant White-breasted Brant


Allan Brooks.

B. American Bittern; scale, $\frac{1}{6}$

Even though it continues to survive in the uninhabited north and still comes down to furnish its quota of sport its disappearance as a resident in the settled communities would be a serious æsthetic and economic loss. It is a noble bird, a point of interest in any landscape. No one fails to thrill at sight of its long V-shaped flocks flying over, or at the sound of its wild barbaric music coming down through the twilight. Domestically, the Canada Goose is a model for man. Unlike Ducks which mate for the season and then part for ever, Geese mate for life, mourn a lost mate, and are not easily comforted. Both sexes assist in the responsibilities of family life and if necessary share the supreme sacrifice in its behalf. We speak of the Goose as the personification of foolishness, but the Canada Goose is one of the most intelligent and wiliest of birds and exhibits occasional bits of strategy that are astonishing.

What can be done to make these evidences of sagacity and devotion familiar to us all has been shown by Jack Miner, who has induced so suspicious a bird to come close about his house, inspired it with such confidence that it becomes as poultry about the back door, yet loses none of its wild ways or independence. Even more remarkable, he has overcome one of its strongest instincts, that of migration, and has induced it to winter far north of its natural wintering ground. If he can do this by means of simple protection and a little food, there is surely no reason, except our own indifference, for losing this magnificent bird from the prairies. Local sentiment can do more to apply practically Jack Miner's spectacular methods than can any law that may be passed, or enforced when passed.

One of the great enemies of the Geese is the automobile. On the prairie's level roads intersecting everywhere, and even with crosscuts across country possible, its untiring wheels follow the weary feeding flocks from pitch to pitch until, unrefreshed and hopeless of rest, they hurry off on their migratory way, refusing to tarry in the neighbourhood where they are so mercilessly harried. Nor are the results more satisfactory to the pursuers, as very few birds are taken in this way, and the survivors are so restless and uneasy that legitimate sport is spoiled for others. Without the development of a more sportsman-like spirit in the shooting public, it seems difficult or impossible to control this evil without laws more drastically curtailing our liberties than it seems possible or expedient to enforce.

173. **Brant** (Including **Black Brant**). *Branta bernicla.* L, 26. Plate XIII A. A small, greyish-brown Goose, paler below, with a black head, neck, and upper breast interrupted only by a partly broken, narrow, white collar on the upper neck.

Distinctions. The black head without white face spots of any kind is characteristic of the Brant. Unfortunately, the term "Brant" has been applied throughout the prairie provinces to the White-fronted Goose, which is an inexcusable misuse of the name. On the Pacific coast and in the interior of British Columbia the term "Brant" is also misapplied to Hutchins's and Cackling Geese.

Field Marks. A small, dark, or nearly black Goose with white V over the tail when flying, but without white face marks. Only to be expected on salt water.

Nesting. On the ground of the tundras.

Distribution. The northern hemisphere. In America, breeding across the Arctic coast and islands and migrating down the seacoasts. It appears inland or on fresh water only as a rare straggler. One record for Manitoba is the only authenticated one in western Canada away from the immediate vicinity of the sea.

SUBSPECIES. The White-breasted Brant is separated from the typical Old World form as *Branta bernicla glaucogastra*, though a doubt has been expressed as to its validity as a separate subspecies. In the Western American Arctics the Black Brant, *Bernicla nigricans* of the Check-list, occurs, but undoubtedly eventually will have to be included as a subspecies of *Branta bernicla*, as intergradations between it and the White-breasted can be demonstrated. The Black Brant is characterized by having the black of the upper breast extending down over the abdomen in slightly reduced intensity, only fading away to white near the vent; and the white collar usually more complete. Strangely enough light and dark-bellied birds seem to meet in the islands of Franklin without interbreeding, yet intergradation between them can be traced over the circumpolar circle in northern Europe and Asia. The Black Brant, intermixed with a few White-breasted and intermediates, migrates down the west coast.

176. **Emperor Goose.** PAINTED GOOSE. *Philacte canagica.* L, 26. A beautifully coloured Goose of medium size. The head is white, with throat and foreneck of black fading into the breast. Whole body light slate grey, each feather of back, flanks, and breast with an edge of white and a subterminal band of black, giving a conspicuous effect of coarse scales or the appearance of a pale grey bird sharply barred all around with lines of black and white. The bill and feet are yellow. Juveniles and adults are similar.

Distinctions. The white head and neck, black throat, and light grey body with black and white scale marks are absolutely distinctive.

Field Marks. The general coloration should be distinctive at long distances.

Nesting. On the ground, on flat marshy islets bordering the sea.

Distribution. Breeds locally on Bering seacoasts of Alaska and Siberia. Winters in north Pacific south to Sitka. A few records for southern Vancouver island.

178. **Fulvous Tree-duck.** *Dendrocygna bicolor.* L, 20·5. A very long-legged Duck, feet reaching beyond end of tail. Head, neck, breast, and underparts uniform rich, yellowish-brown (fulvous), paling on throat to cream, and darkening on crown and hindneck. A broad collar, incomplete behind, of dull white and dark brown stripes. Back, dark brown barred with slightly rusty feather borders. Tail dark brown with white coverts above and below. Wing coverts reddish chestnut.

Distinctions. The only Duck so largely and evenly fulvous likely to be met.

Field Marks. General fulvous coloration and long legs. Too rare to be recorded in Canada on sight identification, except in the most favourable circumstances.

Nesting. On the ground or in hollow trees near water.

Distribution. Southwestern United States, Mexico, South America, South Africa, and India, north in America to central California. But one record for Canada, from southern Vancouver island.

Subfamily—Cygninae. Swans

General Description. Very large, white water fowl. Excepting perhaps the Whooping Crane or the Wild Turkey, the largest of American birds.

Distinctions. Size combined with colour is sufficient to diagnose the two American Swans. Lores (space between eye and bill) unfeathered. Bill begins high on the forehead, at base is almost rectangular in cross-section, and the tip is provided with a flat nail (Figure 144).

Field Marks. Size and colour; our only very large, *all* white bird.[1]

Nesting. On the ground, nest of grasses lined with down plucked from parent bird.

Distribution. Most of the Swans are found in the northern hemisphere, but are not entirely confined to it. In America, one species nests only in the far north, but what remains of the other and rarer one nests south near, or across, our southern border.

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[2]Other large white birds occurring in Canada (except a possible Egret, Glaucous Gull in adult plumage, and some Snowy Owls) have more or less black on the flight feathers.

From time immemorial Swans have figured largely in Old World folk-lore and the fairy tales of childhood are filled with references to them, but it comes with a little shock of surprise to many people to learn that even today wild Swans are actually common in Canada. Geese are wild and wary, but a Swan is even wilder and more wary. Its long neck allows it to feed in deeper water than other non-diving species and through the day it keeps well out from shore, where unobserved approach is impossible. It rarely comes into the shallow marshes that may hide the huntsman and, therefore, it is rarely taken.

The common names of the Swans of the northern hemisphere are indicative of their vocal powers; thus in America we have the Whistling and the Trumpeter, and in Europe the Whooping and the Mute Swans. Peculiar and complicated modifications of the windpipe (Figures 145 and 146), in the form of various convolutions in special bony recesses of the breast bone or sternum, are evidently directly connected with the voice and their complexity increases directly with the quality of the voice as indicated by the above descriptive names; thus the Mute Swan is without any tracheal convolution and the highest complexity is reached in the Trumpeter and Whooping. All Swans receive absolute protection under the Migratory Birds Convention Act and cannot be taken legally anywhere in the United States or Canada.

180. **Whistling Swan.** *Cygnus columbianus.* L, 52. A very large white bird without any other colour in plumage, except in juvenility when there are fleckings and cloudings of light, ashy grey, especially about the head; or at any age, red rust stains may be present on the crown and cheeks. Legs, feet, and bill black. Most adults have a small yellow or orange spot (pink-flesh coloured in juvenility) on the bare skin in front of the eye. (*See* shaded spot, Figure 144.)

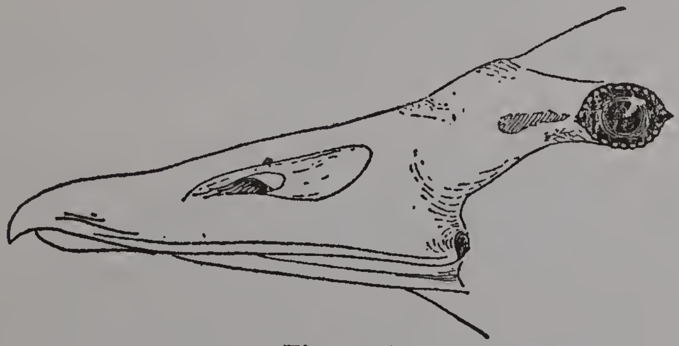


Figure 144
Bill of Whistling Swan; scale, ½.

Distinctions. Because of its large size, and entire whiteness it is to be mistaken only for the Trumpeter Swan, but the Whistling is much the smaller. Its weight goes up to 18 pounds and that of the Trumpeter is given as high as 36. Any Swan under 55 inches long with wing under 23 inches and weight (unless emaciated) less than 20 pounds is probably a Whistling. The bill characters usually given as diagnostic are unreliable. The position of the nostril is not determinative. The presence of a yellow spot in front of the eye is characteristic of the Whistling, but its absence in that species is quite common. The only positive character for the separation of these species, except size and voice, is the sternum or breast bone. In both these Swans the windpipe as it comes down from the neck enters the end of the keel bone, which is thickened into a deep, flat tube for the purpose, proceeds to the rear end of the sternum, and there, within the bony floor, forms a broad horizontal loop and returns and leaves the sternum on its way to the lungs through same opening by which it entered. In this species this return is made directly without other decided flexure (Figure 145). In the Trumpeter Swan another loop is made, rising in a perpendicular hump just before the windpipe emerges from the sternum (Figure 146). The development of this convolution is progressive with age. In very young autumn birds a loop of the windpipe barely enters the sternum. A little later in life it penetrates farther and makes a sharp angular return about halfway back to the sternum. At maturity the loop extends to the rear of the sternum and widens with age until it occupies the whole rear end of the sternum floor and even overhangs it, making a loop 3½ inches or more across.

Field Marks. As a Swan, by size and complete whiteness. In flight, Swans carry their long neck outstretched like Cranes, but do not thrust out long legs behind. The presence of a yellow spot in front of the eye is indicative of this species, but its absence is of little import. The best means of separation from the Trumpeter in life is probably the voice, that of the Trumpeter being considerably deeper, more sonorous, and of a totally different quality. Recognition of this, however, requires familiarity with the voices of both species.

Nesting. On the ground, nest of grasses, moss, etc., lined with down.

Distribution. Breeds on the Arctic coast and islands west of Hudson bay. During migration passes through the interior of the continent, rare on the coasts.

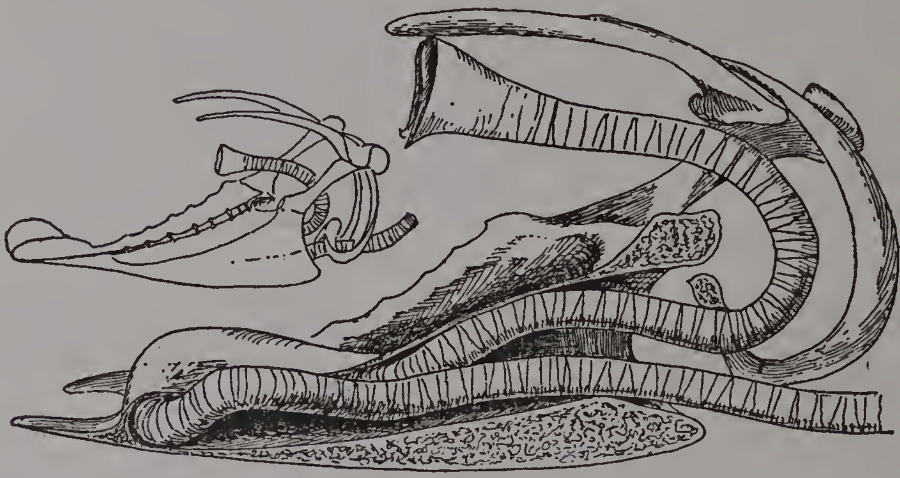


Figure 145
Longitudinal section through sternum of Whistling Swan;
scale, ½.

Owing to its extreme wariness and its breeding far in the north the Whistling Swan has not been seriously reduced in numbers during the past generation. Its larger relative, the Trumpeter, whose breeding grounds, within the borders of settlement, were early disturbed, is now on the verge of extinction. Because of the great difficulty of telling the two Swans apart, the Migratory Birds Convention Act has declared a close season in both of them, in an attempt to save the last few Trumpeter swans from extermination.

Swans rarely come into shallow marshes where cover may hide the sportsman. They are seldom seen except in dense white masses like ice floes far out in the open water, or in flocks flying high overhead and beyond the reach of guns. Their regular migration is generally by night and usually silent, though sometimes extremely noisy. To such habits as these is probably due the fact that few, even of our most experienced sportsmen, know the Swan in life, and fewer still can boast of having taken it. Though flocks of hundreds appear annually on lake St. Clair not more than two or three individuals were taken there each year before the closed season was declared.

The species also occurs in large numbers on Niagara river where on misty or foggy nights in the spring they often drift down with the current into the swift, rough waters of the rapids and are carried helpless over the falls. This catastrophe has occurred several times within the last decade and hundreds of Swans have lost their lives in this manner; some have every bone in the body broken, whereas others are only slightly hurt. As the birds do not seem able in the close quarters to rise above the sides of the gorge, and show marked reluctance to pass beneath the bridges that span the lower pass, all are confined in the narrow waters below the falls where there is no escape. The flesh of the Swan is not usually very suitable for eating and the birds are of little value to those who take them except as curiosities.

181. **Trumpeter Swan.** *Cygnus buccinator.* L, 65. A very large, white bird, like the Whistling Swan but larger and never with a yellow or orange spot in front of the eye.

Distinctions. Because of its large size and entire whiteness, to be mistaken only for the Whistling Swan. This is considerably the larger of the two Swans. Its weight is given as high as 36 pounds; the Whistling seldom goes over 18. Any Swan over 55 inches long, with a wing over 23 and weight above 20 pounds, is probably a Trumpeter. The bill characters usually given as distinctive are unreliable. The position of the nostril is not determinative. The Trumpeter never has a yellow spot in front of the eye like the Whistling, but its absence is not necessarily diagnostic. The only positive character for the separation of these species, except size, is the sternum or breast bone. In both these Swans the windpipe as it comes down from the neck enters the end of the keel bone which is thickened into a deep flat tube for the purpose, proceeds to the rear end of the sternum, and there, within the bony floor, forms a broad horizontal loop, returns, and forms another loop, rising perpendicularly in a hump just before it passes out of the sternum on its way to the lungs, by way of the same opening through which it entered. In the Whistling Swan this final loop is missing (compare Figures 145 and 146). The development of this labyrinth is progressive with age and undoubtedly follows much the same progress as in the Whistling Swan. A bird known to be 18 months old had a perpendicular loop raised 1·8 inches above the sternum floor, but the horizontal loop showed an angular return without broad loop, quite similar in development to a Whistling of the same age. It is doubtful, however, if the species ever gets quite as broad an horizontal loop as do very old birds of that species. The fact that the perpendicular loop develops more rapidly than the horizontal one renders identification of young birds, by these characters, easy.

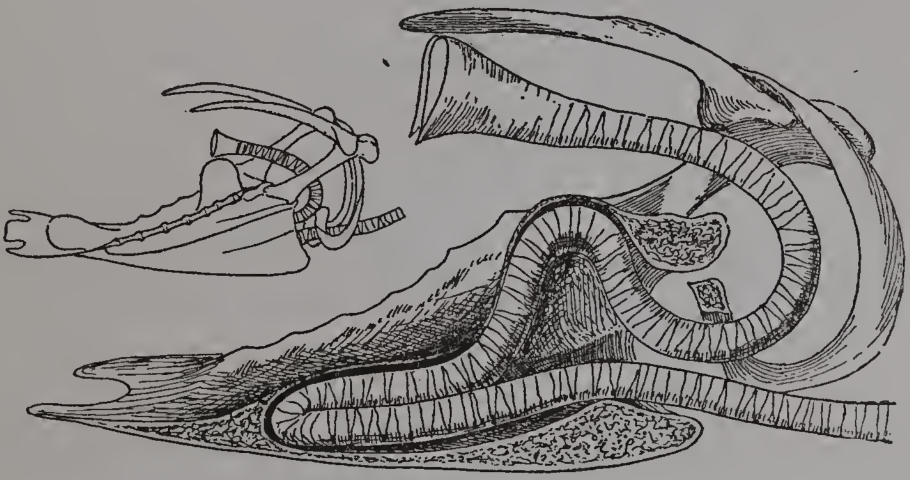


Figure 146
Longitudinal section through sternum of Trumpeter Swan;
scale, ½.

Field Marks. Size and complete whiteness. In flight Swans carry their long necks outstretched like Cranes, but do not trail long legs behind. The best separation of the Trumpeter from the Whistling in life is probably the voice. That of this species is considerably deeper and more sonorous. This distinction, however, is recognizable only by those familiar with both species.

Nesting. On the ground, nest of grass, moss, etc., lined with down.

Distribution. A bird of the interior, breeding northward from the northern boundary of the United States, west of the Great Lakes.

The Trumpeter was at one time a fairly common migrant in the Great Lakes section and a regular nester throughout the prairies and British Columbia. Now, only a few small flocks and individual pairs are known in British Columbia and Alberta. The causes of its nearly complete disappearance were various. It nested in what is now well-inhabited country and it is very difficult to retain such a spectacular bird in communities that are much shot over. Swans are not prolific and once their number is reduced it takes several generations of undisturbed peace to restore them. They are not nearly as wild nor so difficult to kill as the still common Whistling Swan. The latter migrates in great flocks that pitch out in the middle of the larger waters, rarely coming inshore except at night, or when it is perfectly certain that there is no danger. In spite of their great numbers, very few Whistling Swans are shot. The Trumpeter, on the other hand, travels in smaller companies, often family groups, coasts the shore more frequently, often passing the hunter's blind. This difference in habit may have been a determining factor in the disappearance of this bird over most of its range, whereas the Whistling Swan has survived. In the early days, the Hudson's Bay Company did a very large trade in Swan's breasts; the Trumpeter, being the larger and more valuable bird and more easily killed, was probably cleared from its more northern ranges at an early date.

At present strenuous efforts are being made to preserve the last remaining individuals of this beautiful species. Attempts have been made to make reserves of waters they frequent, but they refuse to stay in narrow but safe confines and their numbers are still diminishing. Unfortunately only the stations at one end of the migratory range can be reserved, the other end is difficult to discover or to protect from occasional intruders when discovered by them. A single visit of an irresponsible White or Indian may occur at any time on the loneliest lakes of the northland and destroy a small community and it has now come to the point where every pair counts. Naturally, under these conditions exact information as to the localities these birds frequent has been kept confidential, but it is also necessary that no information of this kind should be lost. All who know of a new station for these birds are urged to communicate with the officials responsible for their protection, not only to assist them in the present but that the data may be preserved until such time as it is safe to publish it more widely.

Order—Herodiones. Deep-water Waders. Herons, Storks, and Ibises

General Description. Usually large birds with long legs, neck, and bill, fitted for wading and obtaining food below the surface in rather deeper water than do the majority of Waders. Bills may be either straight and sharp (Figure 19, page 26), or gently curved and blunt as in the Ibises. Legs are bare for a considerable distance above the heel joint and all four toes are perfect, well shaped, and adapted for perching as well as walking on soft ground, and with only small rudimentary webs or none (Figure 18, page 26).

Distinctions. Birds of this order may be mistaken for either the Cranes or the Curlews. From the Cranes they may be distinguished by their feathered foreheads and hind toe not elevated above the others, and from the Curlews by the bare space in front of the eyes.

The Canadian forms of the order are divided into two suborders: *Ibides* including Spoonbills and Ibises; and *Herodii* including Herons, Egrets, and Bitterns.

SUBORDER—IBIDES. IBISES

This suborder includes two families: Spoonbills, which do not occur in Canada, and *Ibididae,* only one of which occurs in western Canada, and that rarely.

FAMILY—IBIDIDAE. IBISES

General Description. Birds with long, decurved bill quite blunt at the point and the upper mandible grooved throughout its length. Space in front of the eye bare.

Distinctions. Curved, blunt, and deeply grooved bill is characteristic. Claw of the middle toe may be broadened and roughened at the edge, but is not perfectly pectinate or furnished with well-formed comb-like teeth as in the heron-like Waders of the suborder *Herodii* (compare with Figure 20, page 26).

There is only one of these birds, the White-faced Glossy Ibis, that is likely to be found in western Canada, and that as a casual straggler.

187. **White-faced Glossy Ibis.** *Plegadis guarauna.* L, 23. Adult: a dark chestnut bird with green and bronze reflections on back and wings. A long, decurved bill grooved along the upper mandible; a bare spot in front of eyes, coloured a dull red bordered with a band of white feathers. Legs reddish. Juvenile: dull greyish-brown with green and steel blue reflections above; head and upper neck narrowly streaked with white.

Distinctions. A large curlew-like bird with face bare in front of eyes.

Field Marks. A large curlew-like, or small heron-like, bird with decurved bill. Bright chestnut coloration with iridescence or appearing solid black; flight rapid and somewhat duck-like, but the neck carried outstretched.

Nesting. In reedy swamps or low bushes.

Distribution. Temperate and tropical America. On the west coast of South America to southern Oregon. Only two records in Canada, both from the southern coast of British Columbia.

SUBORDER—HERODII. HERON-LIKE WADERS.

As this suborder is represented in Canada by only one family, *Ardeidae,* the description under that heading is sufficient.

FAMILY—ARDEIDAE. HERONS AND BITTERNS

General Description. Heron-like birds with straight and very sharply pointed bills. Forehead feathered, but space in front of eyes bare. A peculiar feature with this suborder is the occurrence of "powder-down tracts"—aggregations of peculiarly modified feathers giving off a dry powder of unknown use. These feathers are found on various parts of the body hidden under the visible plumage. Claw of the middle toe is pectinate, that is furnished with a series of well-defined comb-like teeth (Figure 20, page 26), not merely roughnesses as in the Ibises.

Distinctions. This suborder might be mistaken for Cranes, but the feathered forehead is distinctive. Back of neck bare, the feathers of sides reaching around and behind and hiding the bareness from casual observation. Hind toe very long, set level with the other toes, and not slightly raised as in other Waders.

Field Marks. Obvious heron-like outline, with long graceful neck, long sharp bill (Figure 19, page 26), and lengthened legs (Figure 18, page 26). Neck folded in flight, bringing head close to shoulders, the legs trailing behind. The Cranes, with which they may be confused in life, carry their necks outstretched when flying.

Perhaps no birds are so well known to the general public by common repute and observation as these, yet we seldom hear them correctly named. The terms Herons, Storks, and Cranes, are applied and misapplied indiscriminately. There are no Storks in Canada. The Cranes are quite distinctly characterized from Herons. The birds commonly called Cranes are usually true Herons. The family is divided into two subfamilies: *Botaurinae*, the Bitterns; and *Ardeinae*, the true Herons and Egrets.

Subfamily—Botaurinae. Bitterns

General Description. Marsh-inhabiting, heron-like birds of heavier and less graceful build and habit than the true Herons.

Distinctions. Though forming a well-marked subfamily they are difficult to define in a non-technical explanation. We have but two species under consideration. The Least Bittern is so small, only 13 inches long, as to be unmistakable for any other Canadian heron-like Wader. The American Bittern with its strongly ochraceous yellow coloration and size can be confused only with the juvenile Night Heron (*See* that species).

Bitterns are bog and marsh haunters. They do not frequent wide, open reaches of water, but drop down in the middle or on the edges of grass or reed-grown marshes, stalking their prey by silent approach through the close cover.

190. **American Bittern.** MARSH HEN. THUNDER-PUMP. STAKE-DRIVER. *Botaurus lentignosus.* L, 28. Plate XIII B.

Distinctions. With its size, general yellowish coloration with fine vermiculation and pattern above, this bird can be mistaken for no other Canadian species. It is most like the juvenile Night Heron, but a comparison of Plates XIII B and XIV B will show that the latter has no pattern on the back or only a simple one, whereas the Bittern shows there a very fine and intricate vermiculated design. The black line from the sides of the face may be present or absent, regardless of sex, age, or season.

Field Marks. As the bird rises from the reeds or grass its long neck, dangling legs, and general yellowish coloration are easily recognized. The juvenile Night Heron may seem similar but is never so decidedly yellow and the wing quills are not in such black contrast with the rest of the body. At a distance, in flight, its outline, head drawn in to the body and legs reaching out behind, is so similar to that of the Herons that unless the light so falls as to show the colour, only apparent size differentiates them. Rapidity of wing beat is often a clue to difference in size when other bases of comparison are absent. A large bird can never beat its long wings as rapidly as a small one can.

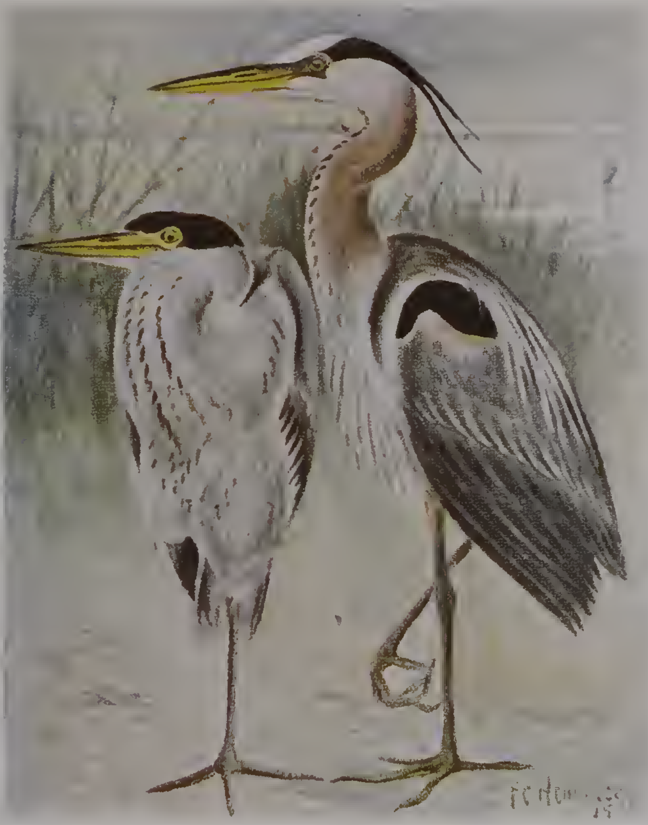
Nesting. On the ground, in grass, hayfields, or reed-grown marshes. Nest of grass or reeds.

Distribution. Across the continent, in the west, north to Great Slave lake, and southern Alaska, breeding wherever found.

References to the lonely booming of the Bittern are frequent in English literature. We can hardly say that our American Bittern "booms," but its note is most peculiar and is unique amongst American bird notes. The common names, "Thunder-pump" and "Stake-driver," are applied in reference to the strange noises it makes. Near a marsh one may hear a sound as of some one driving a stake with a wooden maul into soft mud. There is the dull thud of the blow with a sucking liquid echo, followed closely by a squdgy drive. At other times sounds are heard like some one frantically working a dry suction-pump that draws the water part way and refuses to lift it farther. These are variants of the Bittern's love song and contain no recognizable vocal qualities.

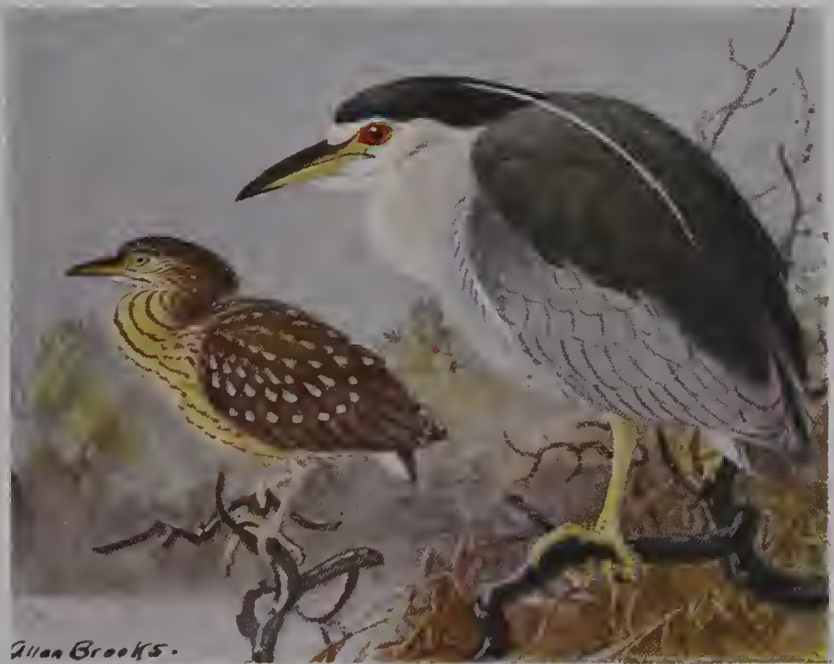
Economic Status. The Bittern is a bog haunter and eats frogs, crawfish, snakes, small fish, crustaceans, insects, and probably even young birds and mice. It eats little or no vegetable matter. Bitterns are quite harmless as a class and may be useful.

191. **Least Bittern.** *Ixobrychus exilis.* L, 13. Smallest heron-like Wader found in Canada. Coloured in broad masses of creams, ochres, and Indian reds, with black or brown back and cap, depending on sex.



A. Great Blue Heron; scale, $\frac{1}{10}$

Juvenile Summer adult


Allan Brooks.

B. Black-crowned Night Heron; scale, $\frac{1}{6}$

Juvenile Adult

Distinctions. Owing to its small size and striking coloration can be mistaken for no other bird in Canada except perhaps its very close and rare relative, Cory's Least Bittern *Ixobrychus neoxenus.* This latter bird has the creams and ochres replaced by seal or reddish brown and it is still undecided whether or not it is only a colour phase of the common form. However, in the western provinces, only in Manitoba is there the slightest possibility of its occurrence.

Field Marks. Small size and striking colours make the species unmistakable. Seldom seen except at close range when colour and size are evident.

Nesting. Generally over water, in nest on platform of dead rushes in a marsh or reed-patch.

Distribution. Eastern North America, regularly only just crossing our border in Ontario and Quebec. There are several records for southern Manitoba.

Subfamily—Ardeinae. True Herons and Egrets

General Description. More slender and graceful birds than the Bitterns and, on the average, larger. The smallest are slightly smaller than the American Bittern. Colour makes the best recognition character.

Distinctions. Herons are usually slate-blue or dull green, but sometimes white. The juvenile Night Heron is dull, pale brown, the Bitterns have pronounced yellow coloration. All Canadian Herons in full breeding condition have long fine plumes on crown, lower throat, or back, that are lost in the autumn.

Field Marks. The characteristic outline in flight, with straight, sharp-pointed bill, head drawn in to the shoulders, and legs trailing behind, is common to both Bitterns and Herons which are better recognized apart by species than as subfamilies. However, any such bird that is obviously not a Bittern is probably a Heron.

Nesting. Herons commonly build in communities, usually in tree tops in wet forests, but sometimes, especially on the prairies, on the ground in marshes or on islets in the lakes.

The Herons are as a rule fishers of open shallows, haunting grassy bogs less than do Bitterns. Instead of stalking their prey they are likely to remain motionless in the shallows until it comes within reach, or only move after it slowly and by imperceptible movements.

194. **Great Blue Heron** (Including **Northwestern Coast Heron**). BLUE CRANE. BLUE HERON. *Ardea herodias.* L, 42. Plate XIV A.

Distinctions. The largest Heron found in Canada; the Sandhill Crane is the only bird for which it may be mistaken. The fully feathered forehead is diagnostic (compare Figure 19, page 26, with 147 and 149, pages 121 and 122).

Field Marks. Heron-like outline, large size, and general coloration make the best field marks. Unlike the Cranes that fly with neck outstretched, the Great Blue, like other Herons, travels with neck folded and head drawn in to shoulders.

Nesting. Usually in large communities in wet woods, such as tamarack, ash, or elm swamps, in nest of large, bulky structure of sticks in treetops. On the treeless prairies they nest on the ground on islets well out in the lakes and removed from prowling coyotes and other enemies.

Distribution. Across the continent, in the west scarcely north of the central prairies; on the coast north to southern Alaska.

SUBSPECIES. The bird of the Prairie Provinces is the type form *Ardea herodias herodias.* On the west coast occurs the Northwestern Coast Heron *Ardea herodias fannini*, an appreciably darker bird, especially on neck and back, and with tarsus averaging shorter. From present information, this race is confined to the coast from Washington northward. The Heron of the interior of British Columbia has not been definitely determined, but is probably typical *herodias.*

This bird throughout most of its range is mistakenly called "Blue Crane" or "Fish Crane." It is not a Crane, however, and especially in the west where Cranes occur commonly such confusion should be avoided.

The Great Blue Heron is a haunter of open, shallow water. It rarely frequents dense reed-beds, though it is often found on their outskirts or on the edges of pools within them. It prefers wide, shallow reaches of rivers, or open flats of marsh or tidal shores. It is a still-hunter, cautiously wading with almost imperceptible movements, or standing statuesquely regarding the water until its prey comes within reach when, with a lightning stroke of the sharp bill, it is secured. Herons, nesting in large rookeries in wet woods, have been peculiarly open to the senseless persecution that seems to follow all our larger birds. Wary and suspicious ordinarily, in the vicinity of their nests they lose much of their usual caution and, in the rookeries, the birds can be shot in numbers. Heronries are usually known to all the surrounding country and are in the breeding season often visited by the rural sportsman who kills the parent birds and leaves the young to die of hunger, although a landowner has occasionally sufficient public spirit to protect heronries on his property. The result is that this picturesque bird is becoming scarce. Heronries once destroyed in this manner are seldom if ever repopulated and new ones are rarely established. Birds breeding in communities are seldom driven away to new locations. They remain until the individuals composing them are exterminated. The Blue Heron is a harmless bird and should receive every protection possible.

Economic Status. The food of the Great Blue Heron is almost entirely animal in its nature, consisting mainly of frogs, snakes, and small fish usually of no economic importance. Cranes frequent the fields for food, but the Herons never do so. Occasionally Herons may visit trout streams where they meander through open meadows, but such cases are rare and insufficient for the condemnation of the species. Herons often frequent the pound nets of the fishermen, but the limited size of their gullets precludes their taking anything of economic importance and the suspicion of the net owners against them is unfounded.

White Herons or Egrets

Though not forming a recognized systematic division of the Herons there are several species showing pure white plumages, that are distinct enough to warrant discussion.

In some of these species, particularly the Egrets, white is the adult plumage; in others, it is dichromatism, that is, the species occurs in two colour phases, either of which is normal, and cannot be referred to either albinism or melanism, or to sex, age, or season. In still other species the white is a plumage of juvenility. These white plumages were a source of considerable confusion in identifying species until they were fully worked out. All the White Herons are of southern distribution and are rare in Canada.

196. **American Egret.** *Casmerodius egretta.* L, 41. Almost as large as the Great Blue Heron, but always pure white. In breeding season a cascade of some fifty fine straight plumes originates in middle back region and festoons over lower back and tail. No plumes on head or neck.

Distinctions. Size, colour, and obviously heron-like outline.

Field Marks. As above.

Nesting. In communities, in nests of sticks in trees or bushes over water.

Distribution. The southern and Gulf States, appearing in Canada only as an accidental straggler. There is one record for Manitoba.

The American Egret, with the Snowy Heron and some other species of like character, constitute the source of the well known "aigrette" or "osprey" plumes of the millinery trade. As these plumes are grown only in the breeding season and as the immediate neighbourhood of the breeding rookeries is the only place where these wary birds can be easily approached it is evident that the harvesting of the beautiful crop is accompanied by great cruelty. The defence is often made that the plumes are picked up after being shed by the parent bird. If any one searches domestic poultry yards for good shed feathers he will quickly realize that recovered "aigrette" plumes will probably be few in number and of poor quality. The explanation is more absurd as the rookeries are situated in dense subtropical swamps where all below is mud and water and the undergrowth prevents close, systematic search even were the spoils worth retrieving. The plume hunter usually hides in the rookery and with a small-calibre rifle shoots the birds one by one until the flock is exterminated. After the plumes are removed the bodies are left to rot on the ground while the young starve in the nests above. Local laws were passed against killing the birds, but without avail. Originally the waters of Florida and the Gulf States were made beautiful with the forms of these immaculate birds; a few years ago they had almost lost one of their greatest attractions as the birds were approaching extinction. As it was found impossible to distinguish between foreign and native plumes or prevent the traffic in the one while permitting it in the other, a federal law was finally passed in the United States prohibiting the importation of feathers for millinery purposes. Similar laws have since been passed in Great Britain, her colonies, and Dominions, including Canada. Today, owing to these measures and the practical suppression of the plume trade, we are glad to say the birds seem to be increasing again.

197. **Snowy Egret.** *Egretta candidissima.* L, 24. A small, pure white Heron. A cascade of fine filamentous plumes falling over the back and recurved at the ends. Similar straight plumes from back of head and from neck over breast. Bill black, yellow about eyes. Legs black, feet yellow. Juveniles and autumn adults without plumes.

Distinctions. Much like several other small white Herons, but characterized by size, black legs, yellow feet, and absence of any colour on tips of flight feathers. Wing, 9·50 to 11. Bill, 2·8 to 4. Tarsus, 3·7 to 4·15. Middle toe and claw, 2·6 to 2·8.

Field Marks. A small white Heron. Not separable in life from some other species that might occur.

Nesting. Nest of sticks in trees or bushes over water.

Distribution. Temperate and tropical America. Formerly bred from Oregon and Illinois south. Now only in the southern states. Occasionally wanders through the western states. The species has been recorded from southwestern Alberta, and a small White Heron taken near Edmonton and now in the Alberta Provincial Museum may be of this species. Two records for the coast of southern British Columbia were reported, but it has been discovered lately that the specimen on which the record relied is a Japanese form, *Egretta intermedia.* This is a bird between the American and Snowy Egret in size, plumed like the latter but with excessively long toes—4 inches long (tarsus 5·9, wing 12·25). It is a bird of India, China, and the Malay archipelago, and not so far recorded in America. It seems almost impossible that such a delicately constructed bird as an Egret could find its way across the wide Pacific by its own efforts and some doubt has been thrown on the eligibility of this particular specimen as a native species of Canada. It will be seen from this that the status of these small Egrets in the west is still open to investigation.

202. **Black-crowned Night Heron** (Including **American Black-crowned Night Heron**). QUA-BIRD. SQUAWK. *Nycticorax nycticorax.* L, 24. Plate XIV B. Adult: body in soft white and pale grey; cap and back black with greenish reflections. Two long (often coherent) white pencil-like plumes falling back from head. Juvenile: light brownish, heavily striped with light cream above, below, and on neck and head. Yearling: light fawn colour on back, lightening, however, to nearly white below and on throat; without stripes except vague ones on head.

Distinctions. About the size of a Bittern, the adult is too distinctly marked to be confused with anything else. The striped young bird, however, is somewhat similar to the Bittern, but never shows decided yellow colours, and the back and wing coverts are coarsely marked with white instead of being very finely vermiculated with minute specks of various colours. The intermediate plumage is in solid masses without any detail on the back.

Field Marks. About the size of a Bittern. Black and pearl grey colour of adult and brownish appearance of juvenile lacking any yellow tendency. The wing quills are slightly if any darker than the back instead of being black as in the Bittern. This species often alights in trees or bushes, which the Bittern never does.

Nesting. Often in communities with Great Blue Herons, either in trees, or on the ground in the marsh.

Distribution. The warmer parts of eastern and western hemispheres. In Canada from the east coast throughout the southern prairies to Saskatchewan.

There is only one eye-sight record for British Columbia, Okanagan lake, although the bird is not uncommon in central Washington.

SUBSPECIES. Occurs in both eastern and western hemispheres. The American Black-crowned Night Heron is subspecifically distinct from that of the Old World under the name *Nycticorax nycticorax naevius.*

The Black-crowned Night Heron is a somewhat heavily built Heron. Though not without beauty and grace it lacks the fine, slender lines of most of the Herons and resembles the Bittern in build as well as habit.

Order—Paludicolae. Marsh Birds. Cranes, Rails, etc.

General Description. This is a poorly-defined order, including a number of families of Waders that can be referred to neither the Herons nor the Shore Birds, but superficially resemble both. They have four long, well-developed toes, without webs, and legs adapted for wading. They are best defined by subfamily description. The Canadian species are divided into two suborders: *Grues*, Cranes; and *Ralli*, Rails—including the Coots. The young, unlike those of the preceding order, are not helpless at birth, but are born with a complete coat of down and can run as soon as hatched.

SUBORDER—GRUES. CRANES

So far as Canada is concerned, this suborder may be called the "Large Marsh Birds," a term, however, which has no other warrant than that of convenience. In this suborder, as in some of the Swans, the windpipe enters a hollow in the keel of the sternum and has similar complicated convolutions (*See* Figures 148 and 150).

FAMILY—GRUIDAE. CRANES

General Description. Large heron-like birds; dull, slaty blue with rusty overwash; or pure white, with black primaries. All colours are in even, over-all tints and there are no plumes or crests.

Distinctions. Distinguished from the Herons by having the forehead as well as the space about the eyes bare, or with a sparse sprinkling of peculiarly modified hair-like feathers and by the lack of pectinations (*See* Figure 20, page 26) on middle claw. The bill is shorter proportionally than that of the Heron, but more heavily built, in both material and shape (compare Figures 19, page 26, and 147 and 149), and the hind toe is elevated above the others.

Field Marks. Cranes fly with outstretched neck instead of with head drawn into the shoulders as do the Herons, and contrary to the habits of Herons they often feed in flocks on upland fields.

204. **Whooping Crane.** WHITE CRANE. *Grus americana.* L, 50. A very large, white, heron-like bird with black primaries and bare, dull red lores, crown, and face streak (Figure 147). Juveniles have not as much colour on the bare parts of the head and face and are more or less completely overwashed with rusty, strongly resembling the iron that stains the white parts of many water birds.

Distinctions. There is no other white crane-like bird of equal size with which it can be confused.

Field Marks. A great white Crane with a red face, standing about 4 feet in height. In flight, the outstretched neck and legs are distinctive for a Crane, and the great size and the white plumage with black wing tips for this species.

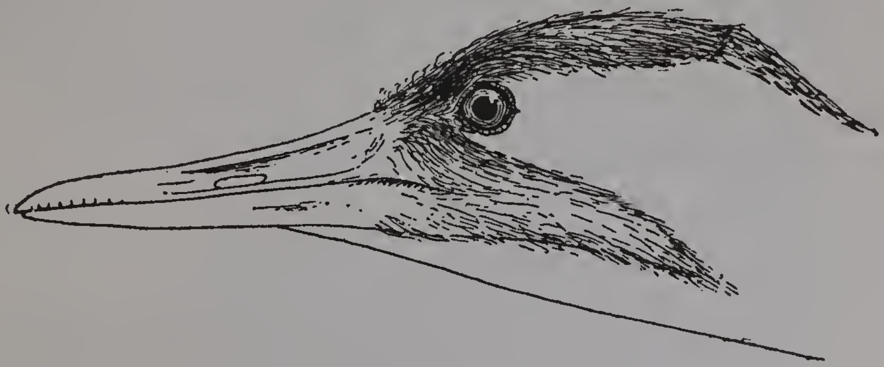


Figure 147
Whooping Crane; scale, ½.

Nesting. On the ground, in the midst of wide marshes.

Distribution. North America, in Canada, west of the Great Lakes to the foothills, breeding throughout its regular range. Now very rare and verging on extinction.

It is a regrettable fact that increased wariness and native vigilance never quite compensate for the handicap of large size in a wild bird or animal in its struggle for existence with civilization. The Whooping Crane is amongst the wariest of birds. It frequents the bare prairies and open sloughs where its great height from the ground gives it every opportunity to note approaching danger; yet from being a fairly common bird on the prairies it has been practically exterminated within the last thirty years. Today in our Prairie Provinces we know of but a few scattered breeding pairs. It is a serious question whether the species can be preserved to posterity. When a species becomes too low in numbers it succumbs to the weakened condition induced by inbreeding in spite of every protection that can be offered. Whether this is the case with the Whooping Crane remains to be seen. At present it is listed among the birds that are protected at all times, and it is to be hoped that this protection has not come too late. The last chance of preserving this, probably the most spectacular bird of the prairies, depends entirely upon the people of the prairies. All localities cannot be watched by wardens and no game laws are capable of 100 per cent enforcement. If occasional birds are killed there, it will matter little to the species that the offender is caught and punished, for the irreparable damage will have been done. Laws can do little for a case like this, but an aroused public opinion is much more efficient. Many may brave the laws on occasion but hesitate before doing that which will bring the condemnation of their personal friends and neighbours. It is to be hoped that no community will permit of the killing or disturbance of these birds without the expression of their utmost displeasure as well as the infliction of the utmost penalty the law allows.

The deep sonorous trumpeting of this bird is probably due to the great length of the windpipe that lies coiled up within the keel of the sternum in a complicated convolution (Figure 148). The windpipe enters the forefront of the keel and reaches directly back to the rear of the sternum, there it bends back sharply, enters into a double coil in the front end of keel, and emerges through the same orifice by which it entered. The folding and looping of the windpipe is much more complicated than either that of the Sandhill or Little Brown Cranes next described (compare with Figure 150).

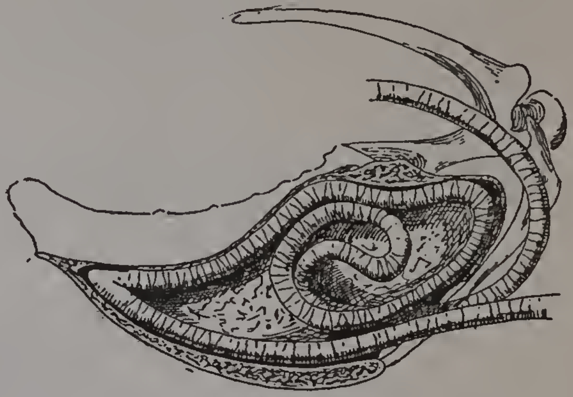


Figure 148
Longitudinal section through sternum of Whooping Crane; scale, about ⅓.

205. **Little Brown Crane.** TURKEY. *Grus canadensis.* L, 36. Slightly smaller than the Sandhill Crane (*See* Plate XV A).

Distinctions. The Little Brown Crane has no other recognizable distinction from the Sandhill than size (*See* Figure 149). A Crane under 39 inches, bill shorter than 5·5, and tarsus under 8·25, is probably a Little Brown. There is considerable variation, however, and some small Sandhills may measure below the above.

Field Marks. Easily recognized as a Crane by dull, even grey or grey overwashed with rust colour; red crown and forehead, and in flight at any distance by flying with head and neck outstretched. Probably not separable from the Sandhill Crane by visual characters in life. Early arrivals in Canada in spring are likely to be Sandhills. Later ones migrating through in late May when the Sandhills are already nesting are more likely to be Little Browns.

Nesting. On the ground in wet spots of the tundras.

Distribution. The Arctics, west of Hudson bay south probably to Great Slave lake. Migrating through the prairies and British Columbia to Mexico.

So similar to the Sandhill in habit, as hardly to warrant separate treatment.

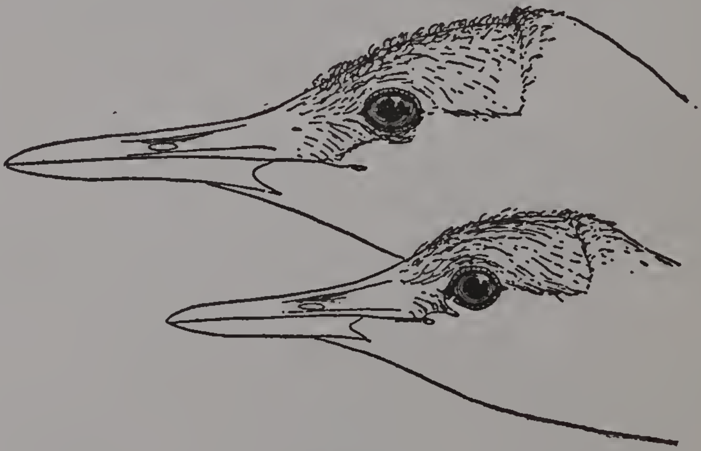
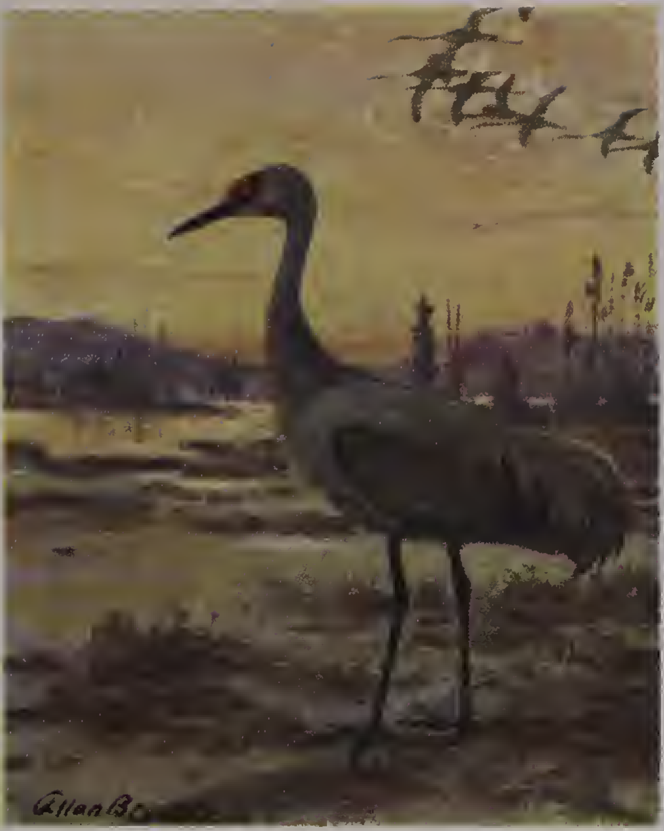


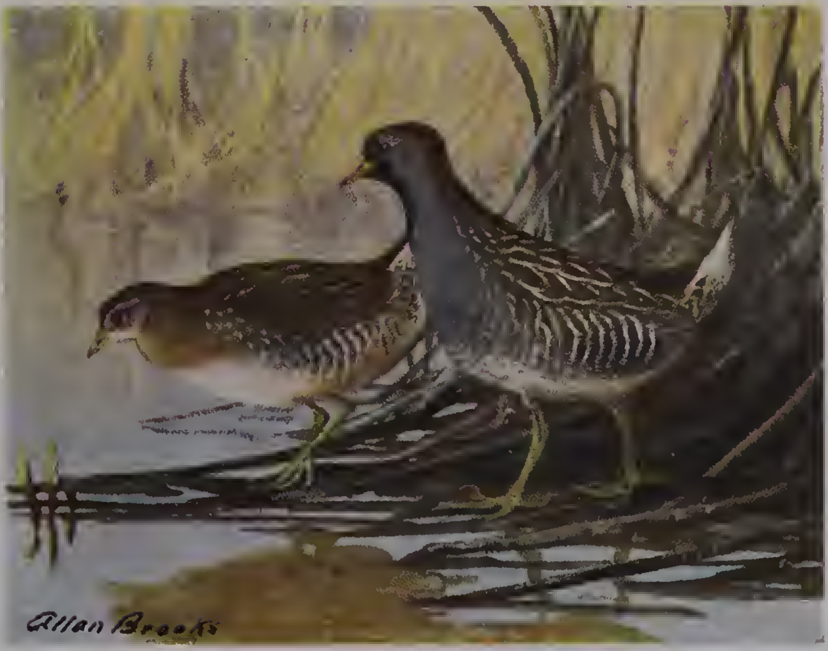
Figure 149
Sandhill Crane; Little Brown Crane;
scale, ¼.

206. **Sandhill Crane.** TURKEY. *Grus mexicana.* L, 40 and over. Plate XV A. Obviously a Crane by its bare forehead and even grey colour, or grey overwashed with rusty. To be confused only with the Little Brown Crane from which it differs only in size (*See* Figure 149). A Crane over 40 inches, bill longer than 5·5 inches, and tarsus over 8·25 inches, is probably a Sandhill. There is considerable variation, however, and occasional small birds may measure in some features below the above.

Plate XV



A. Sandhill Crane; scale, $\frac{1}{20}$



B. Sora Rail; scale, $\frac{1}{4}$

Juvenile Summer adult

Field Marks. Easily recognized as a Crane by general even coloration, and in flight at any distance by outstretched neck and feet, instead of head held in to the shoulders as in the Herons. It is also commonly seen on the high, dry uplands and cultivated fields which the Herons never frequent. From the Little Brown Crane, however, it is probably inseparable in life by visual characters. Early spring arrivals are likely to be Sandhills and on the prairies and in the southern parts of British Columbia breeding or summer resident birds are certainly this species. The Little Browns are still flying northward in large migrant flocks during May, while the Sandhills already are nesting.

Nesting. On the ground in wet marshes.

Distribution. Western North America, breeding west of the Great Lakes northward across our boundary an indefinite distance, for we do not know just where the dividing line comes between the ranges of this and the preceding species. Birds nesting on Great Slave lake are thought to be the Little Brown. South in winter to Mexico.

The rattling tinny trumpet note of these birds is one of the notable sounds of the west. It can be heard for miles. Far away and softened by the distance it reaches the ear; a glance around reveals no sign of life, then away off on the pale prairie horizon a few specks heave into sight, they grow into birds with wide waving pinions, heads outstretched on slender necks as if reaching forward. Hoarse horn answers horn louder and clearer back and forth, throughout the long-drawn line, and they come on with stately measured beat at a pace that eats the miles. A neighbouring hill attracts them, they circle it to see that the coast is clear, and then settle on its top, silhouetted in black against the sky. For a moment the trumpetings redouble as they stand at full height and survey the country for possible dangers, then the sounds cease, one by one the heads drop, the necks gracefully curve as they search the ground about with delicate grace, picking up a morsel here or making a quick reach there with an agile step or two after a fleeing grasshopper. Should the observer show himself the quick eyes note at once, the trumpet is blown, and all are drawn up to attention again. Often, the flock quietly edges over the hilltop where with body hidden from view they observe the suspicious object intently, only the head showing periscope-like above the round swell of the hill. They veritably hide behind mountains and peer over the peaks.

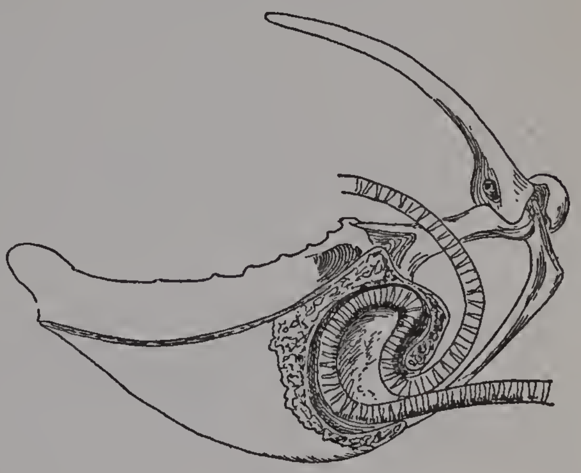


Figure 150
Longitudinal section through sternum of Sandhill Crane; scale, ½.

In mating season they perform strange dances, with jumping, bowing, and gesticulations, the long legs angling stiffly and on occasion the wings waving wildly. Sometimes the ritual culminates in raising a stick or fragment from the ground, and hurling it high in the air. The nest is solitary, situated usually in the centre of a wide, wet, marshy slough, a 6-foot platform of reeds where the two downy red youngsters are hatched, under the solicitous attentions of both parents, for they make an ideal pair, sharing the household duties and responsibilities and probably mating for life. Throughout the summer, groups of unattached, non-breeding birds cruise about from slough to slough; pass the nights on mud-bars far out in the lakes and mornings and evenings their trumpeting flocks can be heard as they pass over or back. These flocks are probably composed of juveniles not ready to breed, or of adults that have lost their mates and have not paired again. They show remarkable attachment to certain localities and a single old bird will return year after year to its old home grounds, calling and trumpeting to others passing over, associating with visiting migrants as they pause on their way, but always returning to its own grounds again when they continue their journey.

In late summer, when the old birds and the season's young gather in flocks, together with migrant Little Brown Cranes, they frequent the grain fields and, occasionally when in great numbers, do considerable damage to the stooks. How much of the damage should be attributed to the Little Brown Crane it is difficult to estimate, probably the greater part, because the Sandhill is becoming regularly scarcer every year as advancing cultivation and attendant dangers are encroaching and rendering its old breeding grounds untenable. Cranes are protected now throughout the year, but, unless the legal fiat is assisted by general public opinion, the Sandhill is doomed to extinction. At present Saskatchewan is the only province where Cranes are seen in anything like their former number, but it is believed that the majority of these are not resident but are smaller migrants from the north.

These two Cranes have long been locally known throughout the west as "Turkeys." To see one in the specimen arouses wonder that a long-legged Wader should ever have been confused with our well-known table-bird; but in life the resemblance is not so remote as might be imagined. The red face resembles the red wattled head of the Turkey and it is interesting to note that another bird, the Turkey Vulture, has evidently been associated with the same species for a similar reason. In feeding, the Crane carries its body low and its head down as it works over a field, when, with its long legs partly hidden in the grass and vegetation, its likeness to the Turkey is considerable.

FAMILY—RALLIDAE. RAIL-LIKE BIRDS

General Description. Toes long and slender to cover a large area of soft, uncertain footing. The pedal characters are somewhat like those of the Shore Birds, but the hind toe is long and as well developed as the others and inserted on a level with them instead of being slightly elevated (Figure 151, compare with Figure 163). In this respect they resemble the Herons, but may be distinguished from them by their un-heron-like build and their feathered lores. In one species, the Coot (Figure 153), the toes are edged with scalloped flaps.

They are typical marsh birds, skulking in the long grass and reeds, running swiftly over yielding masses of half-floating vegetation, and preferring to hide rather than fly at the approach of danger. They all swim, some habitually and others on occasion. The family is divided into three subfamilies: *Rallinae*, the true Rails; *Gallinulinae*, Gallinules or Mud-Hens; and *Fulicinae*, Coots.

Subfamily—Rallinae. True Rails

General Description. Very flat-bodied birds, compressed laterally, adapted for slipping between close-growing reeds and grasses; wings small, rounded, and comparatively weak. The whole structure of the bird is loose, giving the flexibility needed by habit and habitat, but not adapted for prolonged or strenuous effort.

Distinctions. Most easily recognized by negative characteristics; rail-like birds as described above that are not Coots (without frontal shield on forehead: compare with Figure 153).

Field Marks. Rails rise from the grass at one's feet with a loose, feeble flight, legs dangling and neck outstretched. They rise with evident and hurried difficulty, fly weakly a short way over the marsh, and then suddenly collapse into it again.

The Rails are skulkers and expert hiders in the grass. They thread the narrow runways between the clumps with mouse-like dexterity and speed. They rely on their ability to hide more than on flight to escape danger and will often allow themselves to be caught in the hand rather than take wing. A Rail will flush once in a seeming panic, but safely down again it can rarely be forced to wing a second time and in a small isolated clump of cover will seldom be again detected except by a dog's keen nose. Rails can and do swim, but only occasionally and only for a short distance, as when passing from one grass clump to another, they find the water too deep for wading.

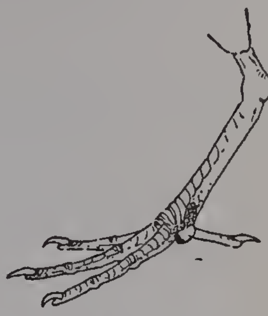


Figure 151
Foot of Rail;
scale, ½.

Rails are very noisy, especially at night. Even in the daytime a sudden and unexpected noise will bring forth a chorus of their loud harsh cacklings from the marsh, though not a bird may be seen.

Our western Canadian Rails can be included in two divisions, a long-billed (Figure 152) and a short-billed (Figure 26, page 27) type. The first is represented by the King and Virginia Rails; the second by the Sora and Yellow Rails.

208. **King Rail.** *Rallus elegans.* L, 15. A long-billed Rail so like the Virginia (which see) except in size as to hardly require further description, the only appreciable difference in colour being in having rufous instead of grey cheeks.

Distinctions. Size, 15 inches instead of 9·50, is a perfect distinction.

Field Marks. As given for Virginia Rail but very much larger. Too rare within the territory covered by this book to be recorded on eye-sight alone.

Nesting. In wet marsh, in nest of grass.

Distribution. Eastern North America. Only regular in Canada in the most southern parts of Ontario. Included here on the basis of one bird reported from Manitoba.

212. **Virginia Rail.** *Rallus virginianus.* L, 9·50. A long-billed Rail (Figure 152). Foreneck, breast, and flanks cinnamon-rufous; back brownish black, each feather broadly margined with an ochraceous shade of breast colour; flanks barred black and white. Cheeks slate grey, almost black in front of eye, and with partial white superciliary line. Bill largely red and legs reddish brown. Juvenile similar but colours veiled with black.

Distinctions. Distinguished from any other Rail likely to be met with in western Canada by its long, decurved bill and general rufous coloration. Young birds, much clouded with black, have been taken for the Black Rail, but the long bill is distinctive. The King Rail is almost exactly similar in colour, but so decidedly larger (L, 15) as to cause no confusion.

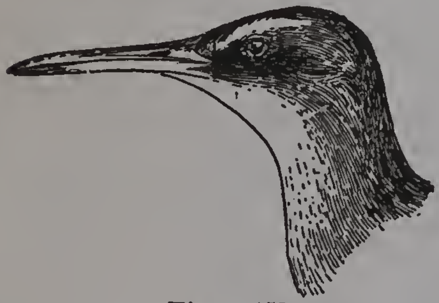


Figure 152
Virginia Rail; scale, ½.

Field Marks. Obvious Rail appearance and habit, size, general reddish coloration, and long red bill.

Nesting. In wet marsh, nest of grass.

Distribution. North America. Breeds across Canada throughout the prairies, perhaps north of them, and in British Columbia into Cariboo district; the northern limit of range is not well known.

This Rail is not quite so common as the Sora, but like it, more often heard than seen. Its characteristic notes are a hard, dry, cackling laugh and a calm whistle given in an ascending third.

214. **Sora Rail.** SORA. CAROLINA RAIL. *Porzana carolina.* L, 8·5. Plate XV B. A short-billed, chunky, little Rail without any shade of rufous on it. About the same size as the Virginia but measuring less because of the short bill (Figure 26, page 27). The black throat and clear, grey breast are not present in juveniles.

Distinctions. The short bill, grey breast, and slightly olivaceous coloration of the back distinguishes the Sora from the Virginia Rail. From the Yellow Rail, its larger size; the hint of olive rather than ruddy ochre in its general coloration; the back being striped rather than cross-barred with white, and the all-dark secondaries.

Field Marks. Loose, dangling flight as it rises and mouse-like skulking in the grass proclaim it a Rail. Short, yellow, instead of long, red bill and lack of rufous coloration separates it from the Virginia; larger size and lack of white patch in wing distinguishes it from the Yellow.

Nesting. In wet marshes, nest of grass.

Distribution. North America. Across the continent, north to southern Mackenzie breeding in Canada wherever found.

This is the most common Rail of the prairie sloughs, at least it is the one most often seen, for it is not quite so inveterate a skulker as are the Virginia and Yellow Rails and perhaps its apparent abundance is due to its greater readiness to flush. It is probably not quite as common as the Virginia in southern British Columbia. It is more often heard than seen and its notes are a soft whistle, a piercing squeak, and rapid whistling cackle of a high pitch in a descending scale, the last being its love song.

215. **Yellow Rail.** *Coturnicops noveboracensis.* L, 7. A short-billed Rail, smaller than the Sora. The coloration is similar in general pattern, but the slight olive cast on back and sides of the Sora is replaced in this species by a warm ochraceous tint, mixed with dark brown, and the back is barred with fine white lines. The breast is brownish ochre; throat light. The wings show prominent white patches on the secondaries in flight.

Distinctions. To be mistaken only for the Sora, but considerably smaller. The sharp, fine, white cross-barring of the back and white secondaries are determinative.

Field Marks. A very small brownish Rail with white wing patches prominent in flight.

Nesting. On the ground in damp edges of marshes, nest of grass.

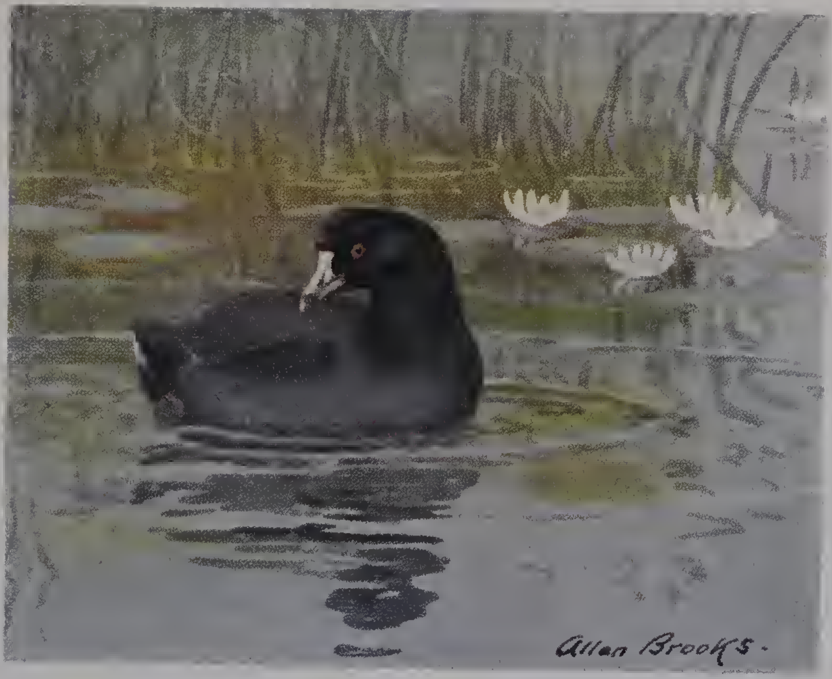
Distribution. Eastern and central North America, across our Prairie Provinces and indefinitely north. Probably the most northern Rail in summer distribution. It has been noted in all our Prairie Provinces, but as yet has not been recorded in British Columbia.

This is the most expert of the Rails in skulking and hiding. As it is almost impossible to flush it, it may be far more common than we suspect. According to actual records, it is one of the rarest birds in Canada. Its habits do not seem to differ much from those of the other Rails, except that it does not require as much water in its habitat, and is more often found on the shoreward, grassy sides of marshes than in wet, reedy locations. Its notes are said to be like the sound of two stones tapped together, with a very plain rhythm—*tick, tick—tick, tick, tick—tick, tick, tick—tick, tick*—and so on in alternate twos and threes.

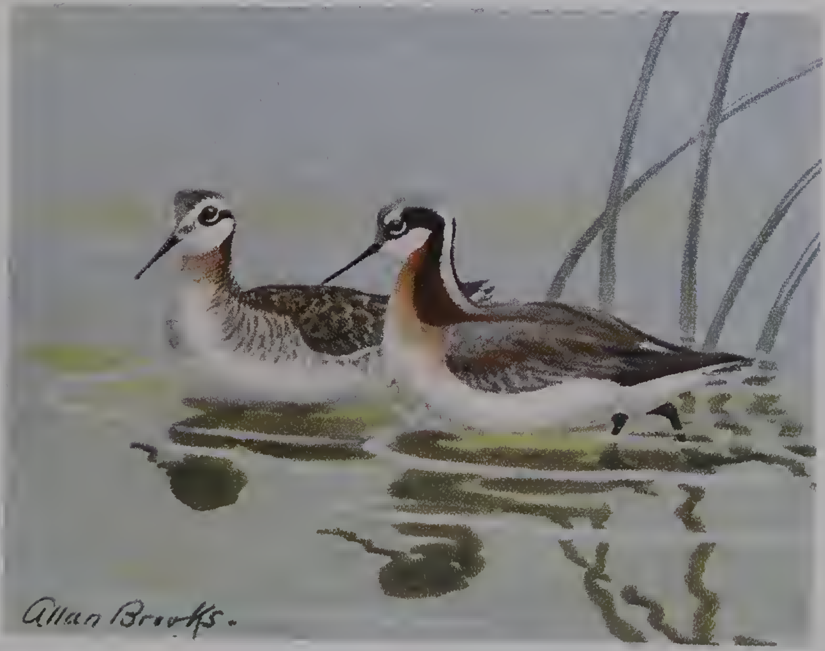
216. **Black Rail.** *Creciscus jamaicensis.* L, 5·50. A very diminutive Rail, hardly larger than a Sparrow. Nearly black in coloration; head, breast, and below dark slate-grey, darkest, to nearly black, on crown. Above, dark woody brown with many small, white round spots. A rich rufous blended band across shoulders and lower neck.

Unsubstantiated records of this minute little Rail have come from the Prairie Provinces, but it is an even harder bird to observe than the Yellow and we know very little of its distribution. It may possibly occur in Manitoba, or its close relative the Faralone Rail *C. coturniculus* on the coast of southern British Columbia.

Distinctions. Very small size, extremely dark colour, and fine specklings of white on the back.


Allan Brooks.

A. American Coot; scale, 1/6


Allan Brooks.

B. Wilson's Phalarope; scale, 1/4
Male Female

Subfamily—Fulicinae. Coots

General Description. Rather large, duck-like birds, but with long toes furnished with membranous lobes; bill extends up on forehead in a dark white plate or shield (Figure 153).

Distinctions. Scallop webbed toes and frontal shield on forehead.

221. **American Coot.** MUD-HEN. *Fulica americana.* L, 15. Plate XVI A. An evenly-coloured, dark, slate-grey, duck-like bird with a white bill and white frontal shield on the forehead, a dark reddish-brown spot at base of frontal shield and similar smaller flecks near the tips of both mandibles. Legs green with scalloped flaps (Figure 153).

Distinctions. The even grey coloration, blackening to head, white bill, and brown-based frontal shield; scalloped webs on toes are absolutely distinctive.

Field Marks. Size, slate-grey coloration, and conspicuous white bill and frontal shield. In the distance on the water Coots resemble Ducks, but have a smaller rounder head and a more slender neck, that gives a characteristic silhouette. As it walks it has a graceful bobbing of the head in time with the step.

Nesting. Usually some slight eminence, such as an old muskrat house, in watery marsh in nest of waste vegetation.

Distribution. North America. Nesting in Canada across the continent, north to the Mackenzie and throughout Cariboo district in British Columbia.

The Coot is a common bird on all our southern waters. In the autumn immense flocks gather on the lakes, often bedding out in the open water in black raft-like masses. They are not generally regarded as desirable game birds and their large flocks have been blamed at times for exhausting the food for more valuable species.

Economic Status. The Coot is a vegetable feeder, but, owing to its habitat, cannot be of economic importance except as a second-rate object of sport.

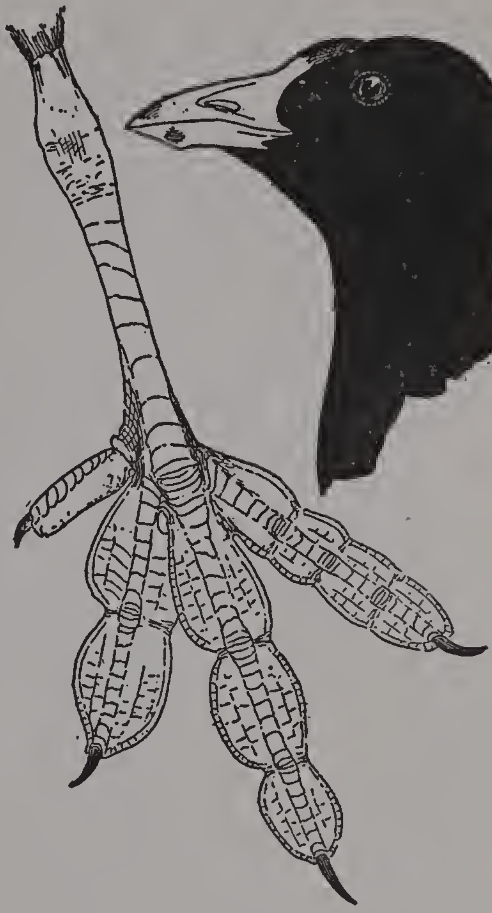


Figure 153
Specific details of Coot;
scale, ½.

Order—Limicolae. Shore Birds. Snipes, Sandpipers, Plovers, etc.

General Description. Shore Birds constitute an order comparatively easy to recognize but difficult to describe briefly. All snipe-like or plover-like birds are included in this order. They have moderately, to extremely, long, delicately formed legs for wading in shallow water and pond edges, and length of neck and bill (Figures 154-184) to correspond. The toes may be either three or four in number, and are poorly adapted for perching. They may be without webs entirely (Figure 163), or with partial webs situated either at the bases of the toes (Figure 165), or forming scalloped or entire edgings to them (Figures 154-156). The hind toe when present is small, weak, and slightly elevated above the rest. The wings are long and pointed and the tertiaries next to the body are lengthened.

Distinctions. Some Shore Birds show superficial resemblance to the Rails, whereas others (Curlews) in certain characteristics may be mistaken for either Ibises or Herons, but may be distinguished from them by the small and elevated, or absent, hind toe and the feathered lores in front of the eye.

Field Marks. General outline, habit, habitat, and flight, characteristics which are usually quite diagnostic.

Nesting. On the ground, except in one species.

Distribution. The order, Shore Birds, is cosmopolitan and there are few areas in the world that some of its members do not occupy. The Old and New World forms of the northern hemisphere are closely related; some are identical, many are subspecifically related, and a few, such as the Turnstone, are found all over the world. Most of our northern species breed in the far north, some of them as far as exploration has gone, though a few nest along, and across, our southern borders.

The Shore Birds, in the days of their original abundance, were, in the east and south, favourite game; now, since their numbers have been so greatly reduced, they are seldom systematically hunted, and are shot only incidentally. Of the Shore Birds of Canada, the Woodcock and Wilson's Snipe are the most interesting game. The representatives of the order found in Canada are divided into six families: *Phalaropodidae*, Phalaropes; *Recurvirostridae*, Stilts and Avocets; *Scolopacidae*, Snipes and Sandpipers, constituting the bulk of our species; *Charadriidae*, Plover; *Aphrizidae*, Turnstones; and *Haematopodidae*, Oyster-catchers.

Economic Status. Most of the members of the order inhabit waste land and have little economic effect; others, frequenting cultivated fields, are of greater importance, and will be discussed under their specific headings. On the whole, the order is either harmless, or actively helpful to man.

Shore Birds have never been regarded as desirable game in the west, where larger and more prized objects of sport were available. Now, since they have become so greatly reduced, Shore Birds, except for a few species, are seldom hunted anywhere. Woodcock and Snipe shooting still have their devotees who care more to exercise their skill than to obtain heavy bags; but Woodcock are too rare west of the Great Lakes to be seriously considered as game and Snipe shooting has not hitherto appealed greatly to the western sportsmen. It was, therefore, little hardship to the western shooter, when the majority of these species were given a continuous close season under the Migratory Birds Convention Act. Though the *Limicolae*, as an order, never seriously suffered in our western provinces, some of its species were not so fortunate. Large waders like the Avocet, Godwits, Curlew, and Willet, that commonly nested in what are now settled communities, have suffered greatly, though not so much from the legitimate sportsman as from the pot-hunter. The Migratory Birds Convention Act came none too soon to save them, and although the future of the vast hordes of lesser waders that nest far to the north seems reasonably secure, that of these larger ones is still doubtful. Those that so hang in the balance include some of the most attractive wild life of the prairies, they add a grace to many otherwise monotonous landscape, and their long, clear, cool, flute-like whistles are amongst the imponderables that give character to the wide, open of the great west.

FAMILY—PHALAROPODIDAE. PHALAROPES. SEA SNIPES

General Description. Small birds between 7·75 and 8·75 inches long, wader-like in form, but with plumage dense and gull-like. This, combined with their toes, bordered with web-lobes or edgings, and flattened tarsi (Figures 154 and 156), makes them comparatively easy to recognize.

Distinctions. Small Waders characterized as above. Cannot be mistaken for any other birds.

Field Marks. Size, and the habit of commonly swimming and feeding in deep water. These are the only Shore Birds that habitually swim.

Nesting. On the ground, nest lined with a few mosses or grasses.

Distribution. Northern and western America. One species breeds in the Prairie Provinces, the other two along the Arctic coasts and adjoining islands.

The Phalaropes constitute a small anomalous family of Shore Birds whose true affinities are hardly well understood or settled. They swim with ease and are often found in the open water, even out at sea, where they are as much at home as any pelagic species.

Anomalous in structure and systematic relationships, they are equally so in habits. The female instead of the male is the bright-coloured member of the family circle, and she takes the initiative in courting rites; makes the first advance towards her shy and modestly-coloured prospective mate; and upon fulfilling her duties of egg deposition, leaves the cares of incubation and family-raising to him.

Economic Status. Inhabit water or waste shores and are of little or no economic importance.

222. **Red Phalarope.** GREY PHALAROPE. WHALE BIRD. *Phalaropus fulicarius.* L, 8·12. Adult female (Figure 154a): all below, including breast, foreneck, and sides of neck, brownish red; white cheeks; black cap; back striped with black and light ochre. Adult male similar, but crown streaked and with less white on face. In winter, an altogether differently coloured bird (Figure 154b). Adult: mostly white, with slate-blue mantle; head white, with poorly-defined dark spot about eye, and stripe down nape. Juvenile: like winter plumage of adult, but vague dusky breast band, and all coloured parts more or less mixed and striped with black and ochre.

Distinctions. A Phalarope with solid red underbody in spring. In autumn a white one with more or less slate-blue on back. In any plumage specifically recognizable by its broad bill (Figure 154c) and as a Phalarope by its scalloped-webbed toes (Figure 154d). The inner secondaries are largely white.

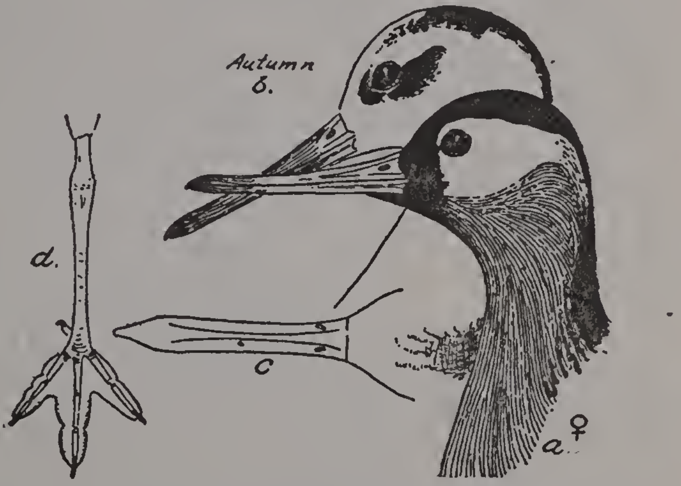


Figure 154
Red Phalarope; natural size.
a, summer female; *b*, juvenile and winter
c, bill, from above; *d*, foot.

Field Marks. Swimming habits and whirligig action on the water, as a Phalarope. Red underparts in spring, large amount of slate-blue on back and large white area of secondaries. It has a short, heavy bill for a Phalarope.

Distribution. Northern and southern hemispheres. In America breeds along the whole Arctic coast and the west side of Hudson bay. Migrates down both coasts of the continent, but rare inland. Isolated records from northern Saskatchewan and southern Alberta.

Though a common bird in the far north, the Red Phalarope as it goes south is seldom detected on our western waters. It is the most maritime of the Phalaropes and probably, when it migrates, strikes out to sea, seldom coming in to our shores.

223. **Northern Phalarope.** *Lobipes lobatus.* L, 7·75. Adult female (Figure 155c): above very dark grey, almost black, including head and face, and extending almost across the breast. Below and a sharply defined throat patch, white. Sides of neck, brick red and a line of reddish ochre down back over each wing. Male (Figure 155b): similar, but colours less pure and pattern less definite. Autumn birds (Figure 155a) largely white. Adult: back, striped grey and white. Juvenile: sooty and ochre. Both—with white throat and face and dark cap, and bar through eye black.

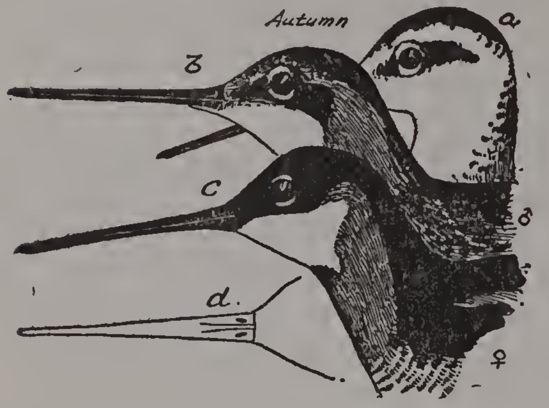


Figure 155
Northern Phalarope; natural size.
a, winter; *b*, summer male, *c*, summer female; *d*, bill, from above.

Distinctions. Colours as above are quite distinctive. The smallest of the Phalaropes. Bill fine and awl-like (Figure 155d), similar to that of Wilson's, but shorter, and quite different from the broad bill of the Red Phalarope. Toes with scalloped half-webs, like the Red (*See* Figure 154d), not a narrow, even border, with slight webs, as in Wilson's (compare Figure 156).

Field Marks. Swimming habits and whirligig action as a Phalarope. Small size. Distinguished from the Red Phalarope in spring by white throat and underparts, and in autumn by dark line through eye and white superciliary line. When the colours are not very evident, probably difficult to separate in life from Wilson's except by smaller size.

Distribution. Northern and southern hemispheres. In America, breeds on the Arctic mainland and islands across the continent. Migrates down both seacoasts and through the prairie interior. Common in the interior of British Columbia. Not quite such a maritime bird as the preceding species, but more so than the following.

224. **Wilson's Phalarope.** GRUNTER. *Steganopus tricolor.* L, 8·75. Plate XVI B. Adults as shown on plate. Young birds similar to the spring male but paler and striped with reddish ochre above. Winter adults are plain greyish above and white below, with no pronounced dark on head. Many birds begin to assume this dress before they leave Canada in the autumn.

Distinctions. About the same size as the Red Phalarope, but with a much longer awl-shaped bill. Considerably larger than the Northern and with longer bill. Toes scarcely webbed but margined with a narrow border, not scalloped as in the two preceding species (Figure 156, compare with 154d).

Field Marks. Swimming habit and whirligig action as a Phalarope. Because of interior range, likely to be confused with Northern Phalarope only. Much larger size and characteristic coloration in spring. In autumn, size is probably the best means of separation.

Nesting. On the grass in damp places near sloughs.

Distribution. The prairie regions, southward. Nesting wherever regularly found in Canada. Only two records for British Columbia.

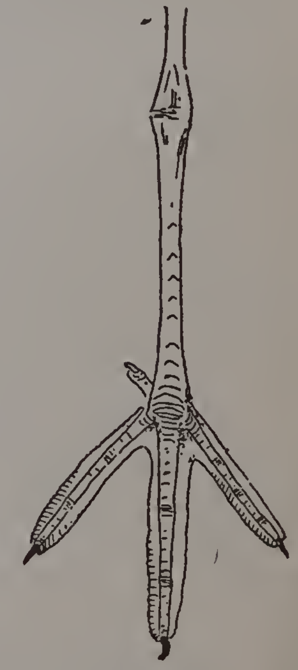


Figure 156
Foot of Wilson's Phalarope; natural size.

One of the commonest as well as one of the loveliest of the inhabitants of the prairie sloughs. It loves the little sunny mud-bottomed pools of shallow water in the meadow. While the males, in grass-shaded nests, are performing the duties of incubation, the females, in little friendly parties, disport themselves with exquisite grace on nearby open water. They swim about like blown thistle-down, their white bodies riding high, breaking up the smooth surface into innumerable interlacing lines of silvery ripples. They pause here and there and whirl about in little circles as the black water-beetles do, stirring up the mud with their delicate little feet and bringing to the surface a harvest of tid-bits which they seize with quick passes of their rapier-like bill. Anon they disperse to repeat the pretty performance a little farther on. A flock of Phalaropes so feeding forms the brightest, most graceful scene imaginable. It is calumny to call their low monosyllabic voice a "grunt", yet it is the origin of one of their local names.

FAMILY—RECURVIROSTRIDAE. AVOCETS AND STILTS

General Description. Among the largest of the Shore Birds and recognizable by their strikingly contrasted colours and great length of leg and bill. The single species that occurs in Canada, the Avocet, is so well characterized and so easily recognized from the specific description that nothing more need be said here.

The Black-necked Stilt *Himantopus mexicanus* may have occurred occasionally in Manitoba, but the records are too uncertain for unquestionable acceptance. It is almost as large as the Avocet, but even longer in the legs. It is pure black and white, the black including all the back and extending up the back of the neck over the crown. The bill is very long, fine, and straight. It should be looked for near the alkaline pools along the southern borders of the Prairie Provinces.

225. **American Avocet.** *Recurvirostra americana.* L, 16·50. A very large and striking Shore Bird. Head, neck, and breast, warm vinaceous-pink, lightening to white about eyes, base of bill, and at base of hindneck, blending into white on abdomen and flanks. Closed wings and centre of back nearly black, separated by broad line of white. Rump and tail white. Wing coverts, outer edge of tertiaries, and inner secondaries, broadly edged with white, making white bar on wing in flight. Legs very long, and pale plumbeous blue. Bill long, very slender, and turned up (Figure 157). All plumages are practically the same.

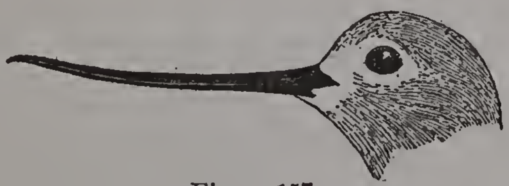


Figure 157
Avocet; scale, ½.

Distinctions. With size, striking coloration, and long, delicate recurved bill, the Avocet cannot be mistaken for any other bird.

Field Marks. Recognizable by size and remarkable coloration at almost any distance.

Nesting. On the ground, near alkali sloughs.

Distribution. Central North America. Breeding on the prairies from the western Manitoba boundary to the mountains, more common in the southern parts and the United States. Occasional records for western Manitoba, and two records from southern British Columbia.

This showy and wonderfully graceful bird is characteristic of the alkaline lakes and pools of the arid prairies. Seen with its delicately blended pink and white coloration, accented by black, on a snowy, alkali-encrusted shore, against deep blue water, it makes a sight that lingers long in the memory. It is not an uncommon bird in certain localities, but how long it will remain so is a matter of some concern to all lovers of the beautiful. Large and showy birds do not thrive in close proximity to settled communities and the scale is turning daily a little more against it, together with the Long-billed Curlew, the Marbled Godwit, and the Willet. Their nests are being trampled by cattle, seeking the moisture of the shrinking pools, their habitat being broken up into wheat fields, and the lakes and pools that are essential to their existence are being drained or are drying up. These are unavoidable circumstances and we would not prevent them altogether, even if we could, for they are but the necessary concomitants of the making of productive acres. However, even under the fullest development of the country there will still remain waste land to harbour a certain number of these attractive Waders, but when they have also to contend with even a small amount of unnecessary disturbance or thoughtless poaching the result is easily foreseen. Today, it is only in the lonelier localities that Avocets remain in appreciable numbers and these places are becoming progressively fewer and more restricted. Under the Migratory Birds Convention Act, a constant close season has been declared on these and similar birds, but unless its terms are fully supported in spirit as well as letter and by public conscience as well as law enforcement, the prairies will soon lose some of their brightest and most interesting features.

There is one particular circumstance in the Avocet's favour. By nature and preference it inhabits those alkaline areas that are of least agricultural value. That this is but a partial and not complete protection is shown by its appreciable but steady decline in numbers throughout the last decade. England regrets the loss of her Avocets; it is to be hoped that Canada will profit by her experience.

FAMILY—SCOLOPACIDAE. SNIPE-LIKE BIRDS. TIP-UPS, SANDPIPERS, ETC.

General Description. Small to medium Shore Birds, the Curlew being the largest species. Feet never entirely webbed nor toes furnished with web-flaps or web-margins. Some species have small webs between the base of the toes, giving rise to the term "semipalmated" or half-webbed. All but one species, the Sanderling, page 141, have four toes. The bills are long, slender, and tapering; usually straight (Figures 159-170); but some down-curved (Figures 174-176); occasionally, as in the Godwits, very slightly upcurved; rather flexible and usually slightly enlarged and sensitive at the tip.

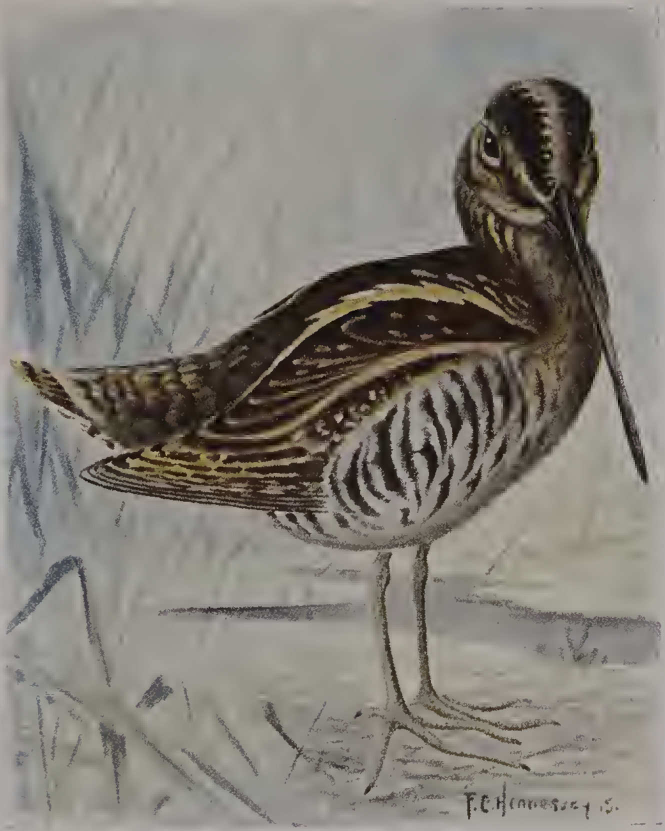
Distinctions. Shore Birds, usually recognized by the above popular names. Bill does not taper to fine, sharp point, like that of the Phalaropes and Avocets (Figures 154, 155, and 157), and without the pronounced enlarged horny tip of the Plover (Figures 178-180), is soft and rather flexible throughout its length (Figure 159 is typical), in contrast with the horny bills of the Turnstones and Oyster-catchers (Figures 182-184).

Nesting. All except one species, the Solitary Sandpiper, page 145, nest on the ground, in slight hollows lined sparsely with waste vegetable matter.

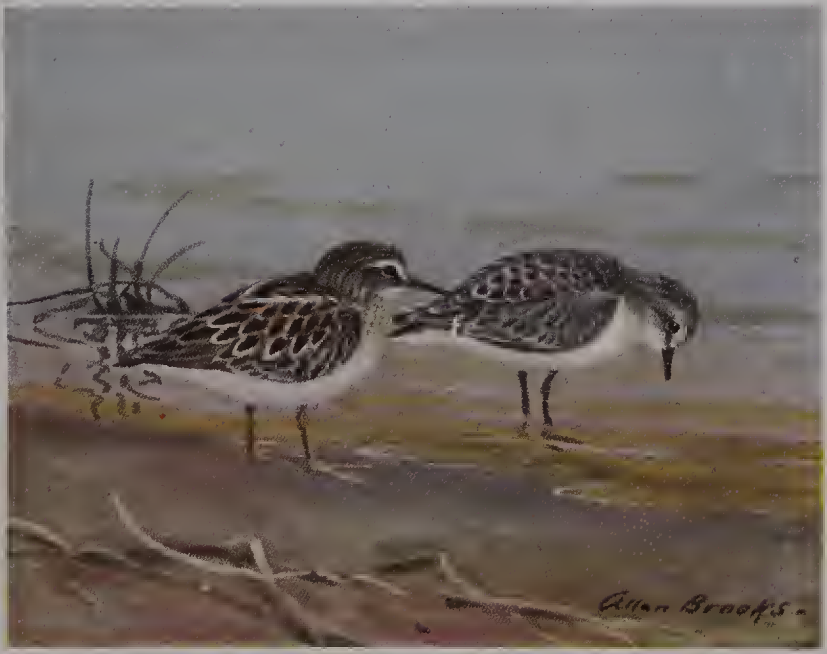
Distribution. The greater number nest in the far north, though a few species south, even into the United States. They migrate down our coasts or through the interior according to species and distribution. Some of them have most interesting migration routes.

Among these birds are the Woodcock and Snipe of the wet woods and marshes; the Tip-ups, Teeters, and Sandpipers seen along the shores and streams; and the Curlew of the uplands. These species formed the great bulk of the wonderful flocks of Shore Birds that once thronged our shores. Breeding mostly far beyond the confines of cultivation the occupation of their nesting grounds by settlers has had only the slightest influence upon their numbers. The great reduction must be blamed upon indiscriminate shooting. As they fly in dense flocks they offer an easy target and eighty or more have been known to fall at one discharge of the gun, so that there is little wonder that they are now comparatively scarce. It is a source of pleasure to know that the western sportsmen are not responsible for the decrease in numbers. A few of the larger forms such as the Curlew and

PLATE XVII



A. Wilson's Snipe; scale, $\frac{1}{3}$



B. Least Sandpiper; scale, $\frac{1}{4}$ Semipalmated Sandpiper; scale, $\frac{1}{4}$
Both young in autumn

the Godwit have suffered from the pot-hunter, but other species as a rule have not been regarded in our west as objects of sport. The removal of them from the list of game birds by the Migratory Birds Convention Act has not, therefore, inflicted much hardship on the western sportsman, but it has done much to conserve the birds in others quarters of their range outside Canadian jurisdiction.

Economic Status. Either perfectly harmless or actively useful according to habitat.

228. **American Woodcock.** *Rubicola minor.* L, 11. A rather large Wader similar to the European Woodcock, but smaller and without any cross-barring below. All above coloured with an intricate pattern of various shades of rich wood-browns; below, a soft, uniform ruddy ochre. Eyes large and set very high in the head.

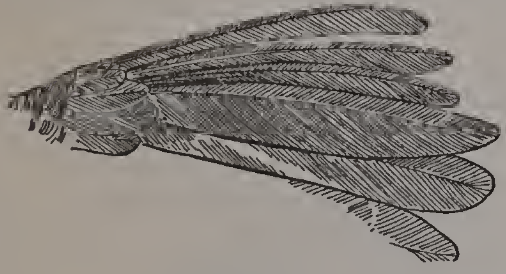


Figure 158
Emarginate primaries of American Woodcock; scale, ½.

Distinctions. Large size, general, uniform ochraceous colour below, mottled wood-browns above, and eyes set high in head. Can hardly be confused with any other species. The first three primaries are peculiarly narrowed (Figure 158), a characteristic not present in any other similar species.

Nesting. On the ground, in the woods, amidst the dead leaves, with which its plumage harmonizes so well.

Distribution. Eastern North America north to southern Canada. Occasional in eastern Manitoba.

Woodcock haunt moist or wet shrubbery, alder or hazel thickets, or the tangled edges of damp woods. They spring suddenly from the ground on being disturbed, rise erratically on peculiarly whistling wings, and passing just over the tops of the underbrush drop suddenly into concealment again a few rods beyond. Woodcock may still be legally hunted under the terms of the Migratory Birds Convention Act, though the privilege is of little importance in the west.

The Pileated Woodpecker, Cock of the Woods, sometimes called "Woodcock," is an entirely different bird and should not be confused with the real Woodcock. It cannot be legally hunted at all.

230. **Wilson's Snipe.** JACK SNIPE. *Gallinago delicata.* L, 11·25. Plate XVII A.

Distinctions. A sandpiper-like bird, with a very long bill (2·5 and over), dressed in wood-browns, ochre, and white. The brick-red tail barred with black and whitening on the outer feathers, will distinguish it if necessary. The Dowitcher is the only Wader of similar size having so long a bill, but its rump and back are largely white.

Field Marks. Grassy meadow habitat, long bill, and peculiar cork-screw flight as it rises with harsh "*scape, scape*" note, together with size, general coloration, and reddish tail.

Nesting. On the ground in grassy meadows.

Distribution. Across the continent. Breeds throughout the Canadian west except perhaps in the most southern parts.

Wilson's Snipe, commonly called Jack Snipe or just "Snipe," is one of the sportsman's favourites. Its appearance on the scene with the first keen frosts, in considerable numbers, with its lying well to a dog, and having an irregular twisty flight, make a combination of qualities that endear it to the true sportsman who desires a test of dexterity rather than food.

It is still permissible under the terms of the Migratory Birds Convention Act to hunt this Snipe.

Throughout most of the prairies in spring and early summer the hollow, rapidly repeated, dull whistle of its love flight can be heard at all times of the day, while its author circles about so high as to be scarcely discernible with the naked eye.

231. **Dowitcher** (Including **Long-billed** and **Short-billed Dowitchers**). RED-BREASTED SNIPE. ROBIN SNIPE. *Limnodromus griseus.* L, 10·50. Spring adult: throat, breast, and all underparts strongly brick-red. Back and upperparts, dark brown with feather edges of various shades of reddish ochre. Tail and rump finely barred with black and white. Tail feathers tinged with reddish at tip and dark bars disappearing on lower back. Autumn plumage—dull grey on back, more or less interspersed with brown and ruddy ochre of summer plumage. Head, neck, breast, and flanks, lighter grey. Chin lighter than breast or face. Autumn adults often show the summer red-breasted plumage, but worn, faded, and interspersed with grey.

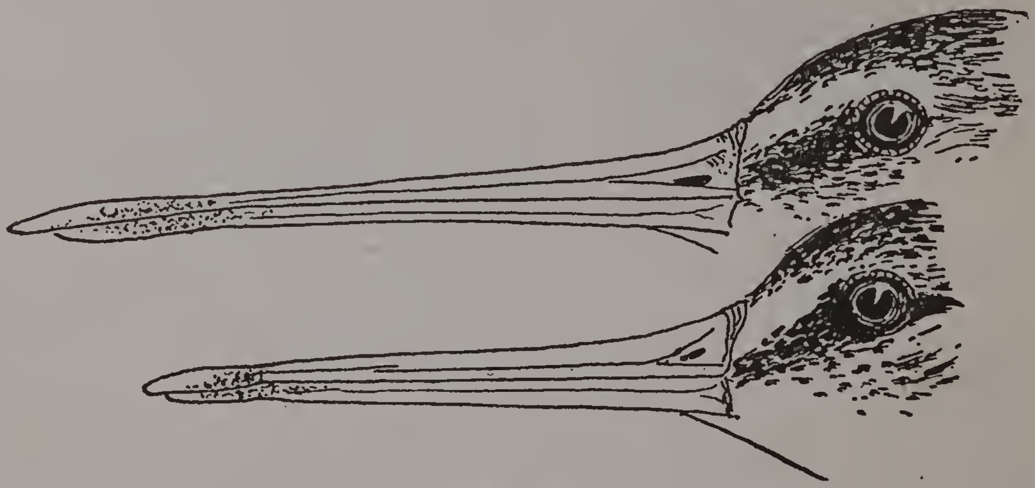


Figure 159
Bills of Long-billed and Short-billed Dowitchers;
natural size.

Distinctions. Because of great length of bill (2·15-3·0) to be mistaken only for Wilson's Snipe. In spring, the red underparts make the Dowitcher unmistakable for that species, and in autumn the even grey breast, the lack of definite colour pattern on the back, and the pure white lower back barred with black on rump and tail are distinctive. In spring, the Knot has a similar red breast, but the bill is much shorter, scarcely over 1·50 (compare Figure 159 with 161).

In the autumn the Wandering Tattler (to be met with only on the west coast) has a grey appearance similar to the Dowitcher at that season, but is a clearer ashy grey; the bill is much shorter and the rump and tail are the same colour as the back.

Field Marks. About the same size, general outline, and length of bill as Wilson's Snipe, but with white lower back. Generally found on bare mud flats where the latter is seldom found. Rarely seen in grassy meadows.

Nesting. On the ground.

Distribution. North and South America, breeding in the Arctic. Migrating along the coast and the interior, throughout Canada.

SUBSPECIES. The American Ornithologists' Union Check-list recognizes two subspecies: the Short-billed Dowitcher *Limnodromus griseus griseus*, an Atlantic coast race, and the Long-billed Dowitcher *Limnodromus griseus scolopaceus*, a western one. These races are differentiated mostly by the length of the bill (Figure 159), but the eastern race is recognized in migration throughout the west. Specimens from the prairies to the Pacific coast show such a mixture of bill lengths that serious doubts are justified as to the existence of the two races, especially as no evidence of separation of breeding areas has yet been produced.

233. **Stilt Sandpiper.** *Micropalama himantopus.* L, 8·25. A small Sandpiper. Spring adult with brown markings on a ground of dull white and cream; underparts with regular and narrow bars that change to fine obscure striping on foreneck and minute spotting on throat. A vague rufous band across nape and continuing over eye, and another of same colour under eye and over ear (Figure 160). Rump, white, spotted with brown. Young autumn birds are entirely different, and so closely resemble several other species as to be difficult of separation by colour. Back, much like that of spring bird, brown with feather edges of ochre, cream, white, and rusty; incoming ashy-grey winter plumage is likely to be intermixed and to predominate late in the season. Below, white, slightly tinged with tawny, which is most pronounced across breast with more or less striping. Head and neck a fine intermixture of ashy-brown and dull white with little detail. The crown and a vague line through eye are dark and the superciliary line and throat light.

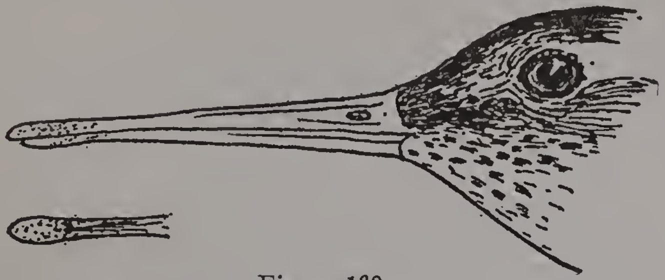


Figure 160
Bill of Stilt Sandpiper, enlarged tip, from above; natural size.

Distinctions. The spring bird with its heavily brown-barred underparts is very distinctive. The autumn bird is much like the Pectoral, White-rumped, Baird's, or Red-backed Sandpipers, but from any of these it may be recognized by its long, yellow legs reaching nearly an inch or more beyond the tail, and the slight spatulate enlargement at the tip of the long bill, almost imperceptible, but very apparent to the touch (Figure 160). The rump may be almost pure white and bear a close resemblance to the White-rumped.

Field Marks. The regular and pronounced dark barring below is quite conspicuous in spring. When this detail cannot be seen, or in the autumn, the great length of leg furnishes the best field mark from all comparable Waders, except the Lesser Yellowlegs which it may resemble in apparent size, length, and colour of legs, and white rump. It has a longer bill than any other Sandpiper of similar size and in feeding may plunge its whole head and neck under water. It does not tip or nod.

Nesting. On the ground.

Distribution. Breeds in the western Arctic, migrates mostly through the prairie interior. There are a few records for southern British Columbia.

234. **Knot.** RED-BREASTED PLOVER. ROBIN SNIPE. *Calidris canutus.* L, 10·50. A medium-sized Sandpiper. Spring adult, brick red throat and breast; abdomen and under-tail coverts, white. Above, finely mottled with black, greys, and light ochre running into stripes on crown. Uppertail coverts, not including lower back, white, barred with black. Autumn birds entirely different; pale ashy grey above from crown to rump with very little pattern; feathers of back slightly edged with white, usually backed by fine black line, giving an impression of a series of pale semi-circles. All white below; faintly and obscurely striped across breast and up throat.

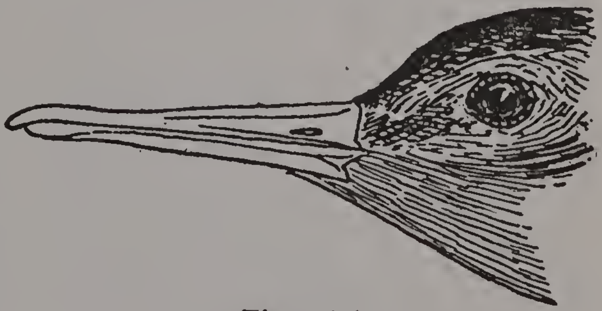


Figure 161
Bill of Knot; natural size.

Distinctions. Spring birds can be confused only with the similarly red-breasted Dowitcher, but are easily distinguished by shorter bill (Figure 161, compare with 159). In autumn, by short bill; lighter, more even grey above, with the faint semicircles on back and grey rump. The breast band is faint, being formed of fine stripes instead of an over-all clouding.

On the west coast in autumn it may be confused with the Wandering Tattler and the Surf Bird, both of which have the same general coloration, including suggestions of light semi-circles on the back. The bill, between 1 and 1½ inches long, is shorter than that of the Tattler and longer than that of the Surf Bird (Figure 181). The grey of the back is more ashy than either, especially of the Tattler which is inclined towards bluish-grey. The breast is intermediate between the two—faintly striped instead of heavily marked as in the Surf Bird, or evenly bluish-grey as in the Tattler. The best distinctions, however, are the uppertail coverts. In the Knot these are white, irregularly barred, and marked with dark; in the Surf Bird they are pure white, and in the Tattler grey, the same colour as the back.

Field Marks. In spring, red breast, and bill not much longer than head. In autumn, even light grey coloration above, without definite white spots or lines, and a short bill. Rump light in general effect but not white, as in the Surf Bird, and not extending up the back as in the Dowitcher.

Nesting. On the ground.

Distribution. Northern and southern hemispheres. In America, across the continent, breeding on the Arctic islands, migrating throughout the interior and the coasts, but more common on the latter. A bird of extraordinary range, wintering in South Africa, Patagonia, and New Zealand.

235. **Purple Sandpiper** (Including **Aleutian Sandpiper**). WINTER SNIPE. ROCK SNIPE. *Arquatella maritima.* L, 9. A rather small Sandpiper. Adult in spring: above, dark brown, variegated on edges and tips of feathers with pale buff, white, and more or less rusty-ochre; below, white, with breast greyish-brown tinged with rufous, with scattered white feather tips, or irregularly blotched with blended brown and rusty ochre extending along the flanks in broad spots and up the throat in fine streaks. Rump dark; inner secondaries largely white. Legs dull orange to olive ochre.

In autumn and winter: back, to crown, slate-grey, back feather centres almost black with slight purplish reflections. A paler grey band suffused across breast and up neck, leaving throat lighter and breaking into coarse spots on lower breast and along flanks. Some individuals carry this winter plumage well into the following summer.

Distinctions. Adult in spring more or less reddish above and, in west coast birds, with a blotchy, dark breast band. Somewhat similar to the Red-backed Sandpiper, but separated from it by larger size though shorter bill (under instead of over 1·25). The red on the back is not so extensive and is confined to feather borders and never barred across them. The dark area below extends from the lower breast towards the throat instead of over the abdomen, and the breast is, therefore, mostly dark instead of nearly white.

In autumn or winter it may be distinguished from other similarly coloured grey and white Waders such as the Knot, Red-backed Sandpiper, Wandering Tattler, and Surf Bird by size—larger than the Red-backed, smaller than any of the others. From all except the Surf Bird it may be distinguished by its darker coloration, sharp coarse spotting on lower breast and flanks, and the dark, almost black, centre to the feathers of the back. Besides having a darker back and being smaller it is infallibly separated from the Surf Bird by having a dark instead of a white rump.

Field Marks. In spring, general suffused dark colour and short, yellowish legs. In autumn, it comes very late and winters on the rocky coast where it is likely to be confused only with the Wandering Tattler and the Surf Bird. It is smaller and darker coloured, especially across the breast, than the former and, unlike the latter, has a black instead of a white rump.

Nesting. On the ground amongst the rocks.

Distribution. Northern part of northern hemisphere. Breeds in the Arctic, Aleutian, and Pribilof islands and migrates down the coasts. Winters along our coast. Reported from the interior, only on the big lakes of Mackenzie.

SUBSPECIES. Two subspecies are recognized as occurring in Canada: *Arquatella maritima maritima*, the type form occurring in both New and Old Worlds. This is the form of eastern Canada and the one to which the few Mackenzie records are ascribed. *Arquatella maritima couesi*, the Aleutian Sandpiper, breeds on the Aleutian and some other islands of Bering sea and migrates down our west coast. It is difficult to separate from eastern *maritima* in autumn; but in the spring has considerably more red on back and more dark on breast.

The Purple Sandpiper and its races are birds of the rocky islet shores. It is a late autumn arrival and spends the winter on the sea-girt rocks of the outer Pacific coast in company with Black Turnstones and Surf Birds.

238. **Sharp-tailed Sandpiper.** *Pisobia acuminata.* L, 8·50. A small Sandpiper of same general size and coloration as the Buff-breasted, but with the ochres less extensive and solid. Back, dark brown with many feather edges of ochre and rusty. Below, white tinged with ruddy brown, strongest on breast where it is finely and brokenly streaked—not nearly as uniform or complete as in the Pectoral Sandpiper but more than in the Buff-breasted. Crown, strongly rufous, bordered by a light superciliary line. Tail pointed and composed of pointed feathers.

Distinctions. Most like the Pectoral or Buff-breasted Sandpipers, but with red crown and pointed tail. The breast is far more sparsely spotted and the breast band more diffuse and inconspicuous than that of the Pectoral. Separated from the Buff-breasted by light superciliary line, red cap, more specklings on throat, and without the beautiful under-wing pattern of that species, back striped rather than with scale-like rings.

Field Marks. A little Wader, similar to the Buff-breasted in colour, but of different habit, habitat, and outline. Has a reddish cap, a light line over the eye, and a white chin.

Distribution. Eastern parts of eastern hemisphere. Breeds on the Siberian coast and only occasionally wanders down to our shores. We have a few records from the vicinity of Vancouver island and Queen Charlotte islands. Not to be expected in the interior.

239. **Pectoral Sandpiper.** GRASS SNIPE. *Pisobia maculata.* L, 9. A small Sandpiper with a distinct, plainly defined, buffy band, heavily and evenly streaked with fine, brown lines, across breast and foreneck. Above—dark brown striped with many buff and whitish feather edges, rusty in autumn juveniles. White below.

Distinctions. A brown-backed Sandpiper, with buffy breast band sharply defined against white throat and underparts. Two other Sandpipers—the White-rumped and Baird's—have similar breast bands. In the White-rumped, the ground colour of the band is dull white or ashy rather than buff, the pencilling is sharper, and usually in greater contrast; it also has a white rump which is absent on the Pectoral. In Baird's, the breast band is similarly buffy, but decidedly less pronounced, and sharply defined at its borders; the striping is obscure and very much blended and the back does not give a striped effect. The Pectoral, as a rule, is decidedly larger than either of the above, but there is considerable variation in size in the species. A bill of one inch or over will separate this species from the others.

Field Marks. A small Sandpiper, with broad, dull breast band, a striped back, rather rusty in autumn, and no other particular recognition marks. Usually found in grassy marshes.

Distribution. North and South America, breeding on the Arctic and Alaska coasts from the mouth of the Yukon to the Mackenzie, migrating throughout the whole of southern Canada.

The Pectoral Sandpiper like Wilson's Snipe is to be found in wet, grassy meadows or on mud flats, rarely on sandy beaches. In breeding season it develops a neck sac that can be inflated to an extraordinary extent, and it indulges in a remarkable flight song. Many of the Waders have very interesting flight songs, but these are confined to the breeding season and the immediate vicinity of the nest and are seldom heard by the ordinary observer.

240. **White-rumped Sandpiper.** BONAPARTE'S SANDPIPER. *Pisobia fuscicollis.* A small Sandpiper. White below; brown above, variegated with feather edges of shades of buff, rusty, and white. In spring, breast and flanks sharply and clearly streaked with dark brown. Rump always white. In autumn, the breast streaking is often suffused with a vague breast band of light ashy or even pale buffy.

Distinctions. Very much like an enlarged Least Sandpiper (*See* Plate XVII B). May be mistaken, especially in autumn, for either the Pectoral or Baird's Sandpipers, but easily separable from them by the white rump. The Stilt Sandpiper also has a white rump, is of similar size, and in autumn of similar general coloration, but has a considerably longer bill (over 1·25, instead of under) with a slightly enlarged tip (*See* Figure 160) and long legs reaching beyond the tips of the closed wings.

Field Marks. A small Sandpiper lacking strongly determinate coloration, with a short bill, about the length of the head, and a white rump.

Distribution. North and South America. Breeding on the central Arctic coast from the Mackenzie eastward, migrating through the interior and the east. More common in the eastern than the western prairies and so far not recorded from British Columbia.

Commonly seen with the Least and Semipalmated Sandpipers on muddy rather than sandy shores.

241. **Baird's Sandpiper.** *Pisobia bairdi.* L, 7·40. A small Sandpiper somewhat similar to a large Least Sandpiper (Plate XVII B). Below, white; above, brown, variegated with feather edges of shades of buff, rusty, and white. A suffused band of pale buff across breast, softly streaked with darker.

Distinctions. The buff breast band is suggestive of the Pectoral Sandpiper, but it is never so extensive nor so sharply defined and the striping is always soft and obscure. In some conditions of plumage it may look like the White-rumped Sandpiper, but the black instead of white rump will separate it easily.

Field Marks. In life, like a large Least or Semipalmated Sandpiper, but with a buffy breast suffusion and a scaly rather than striped appearance on the back. It commonly accompanies flocks of "Peeps." Often in life like a Buff-breasted Sandpiper owing to white underparts being in shadow, but with black instead of dull yellow legs and with a whitish chin.

Distribution. North and South America. Breeding in western Arctics. Migrates along both coasts and through the interior.

PEEPS

"Peeps" is a colloquial, collective name applied to the smallest species of Sandpipers. They do not form a systematic group but are similar enough in habit and general appearance to be popularly grouped together.

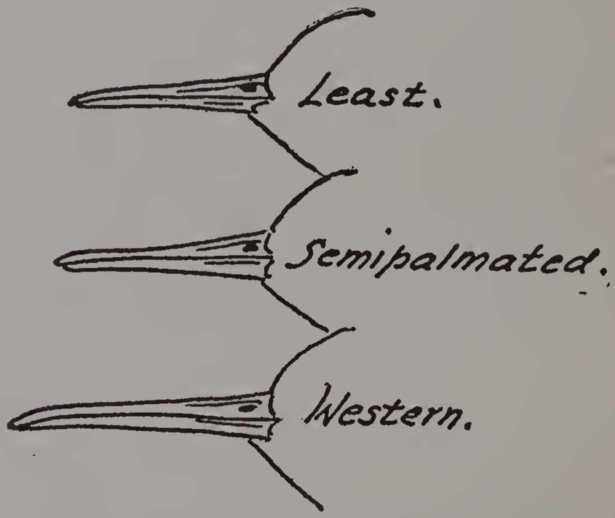


Figure 162
Characteristic bills of Peeps;
natural size.

They are minute Shore Birds, not larger than small Sparrows. They come in immense flocks and cover the mud-flats and sand-bars with a dense, busy crowd, weaving complicated patterns of delicate footprints in the soft mud. They follow a retreating wave to garner the roughly tumbled insect life in the undertow, and glide back in calm haste, just ahead of the next inundation. They take advantage of every ebb and flow, and though not unduly hurried never overstay their opportunity, but judge each mo-

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Note. These bill sizes are not by any means infallible. There is considerable individual variation and occasional Semipalmated, or even Western, Sandpipers may have bills smaller than some Leasts. In life it is claimed that the bills of the Least and Western are appreciably decurved, but that of the Semipalmated is straight or slightly upturned. It takes careful observation to note this, however.

ment with exactness. Thus they work along a shoreline, examining its every inch. They are confiding, rather than brave, unconcerned where other species would be fearful. They fly suddenly in momentary panic with a chorus of fairy peepings, but the next moment forget their alarm, and return to the same spot immediately to continue rather than resume their interrupted microscopic searchings. By taking station close by the course along which they are working and remaining reasonably quiet, it is possible to have the whole, happy, busy, little company pass in close review. When they take flight, they start as if at a pre-arranged signal, with a shower of rippling little whistles, and dash off in a compact body, turning and wheeling as if moved by a single impulse. One instant they show a cloud of dark backs, and then, as they bank on another turn, every white underbody is simultaneously presented, and the flock flashes in the sun like a heliograph. After a few such turns they settle down again, and proceed immediately with the serious duty of cleaning up the beach as if not a moment should be lost.

Some of them remain with us almost into summer, and, in the autumn, they return long before most observers have any inkling that the migrations are under way. The first of June may see the last spring straggler, the first of July their autumn advance guard, and by August first their migrations are well under way. The species that associate together and are usually included as "Peeps" are the Least, Semipalmated, and Western Sandpipers. They are often accompanied by Baird's, White-rumped, and others. Some of these species are very difficult to know apart in life and, unless the observer has unlimited time and patience to examine critically the fine details of every flock he meets, many of them will be passed by as simply "Peeps." In general, the Least is the darkest, the Western the reddest, and the Semipalmated the greyest of the three.

242. **Least Sandpiper.** MUD PEEP. GREEN-LEGGED PEEP. *Pisobia minutilla.* L, 6. Plate XVII B. The smallest of our Sandpipers

Distinctions. Not easy to separate from the Semipalmated or the Western Sandpipers, but slightly smaller than either. The best distinction is the unwebbed toes (Figure 163, compare Figure 165). The legs are olive-green or ochre-yellow instead of dull black. In general, the Least is (excepting the Western Sandpiper, which is purely a coastal bird) the brownest, in some cases decidedly ruddy on the back. The breast band often tends towards buffy and the stripes are rather diffused. The bill is slightly smaller and more slender than that of the Semipalmated and decidedly smaller than that of the Western (*See* Figure 162).

Field Marks. Very small size characterizes it as a Peep· Averaging on the back darker and redder, ruddy rather than greyish; more decided breast band with more diffuse striping than Semipalmated, darker and not quite as red as the Western. Careful observation under favourable circumstances will show dark olive-green legs.

Distribution. North and South America. Breeds across the continent south of the Barren Grounds. Migrates through the interior and along the coasts.

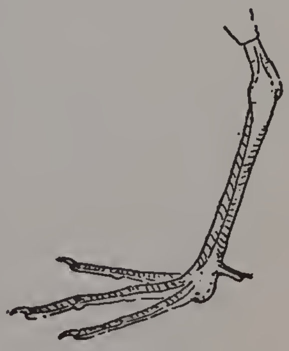


Figure 163
Foot of Least Sandpiper: natural size.

One of the most numerous of Shore Birds. Probably its diminutive size has protected it from the sportsman, though from its dense flocks numbers can be obtained with a single shot. It frequents sandy beaches and open mud-flats and is a tame and confiding bird. It associates largely with flocks of other species, though when disturbed separates from them to rejoin the company later.

243. **Dunlin** (Including **Red-backed Sandpiper**). BLACK-HEART PLOVER. *Pelidna alpina.* L, 8. A small Sandpiper. Spring adult, back extending to crown predominantly red; very finely striped across breast, up neck, and on face, with ashy brown on white. Throat white. Large black area occupying abdomen. Bill slightly down-curved (Figure 164).

In autumn, plumage soft, uniform, light ashy grey all above and suffusing across breast; remainder white. Autumn adults usually have a few of the red summer feathers on the back. There is a juvenile plumage with black and buffy back and a spotted breast of which only traces remain when the birds return to us in the autumn.

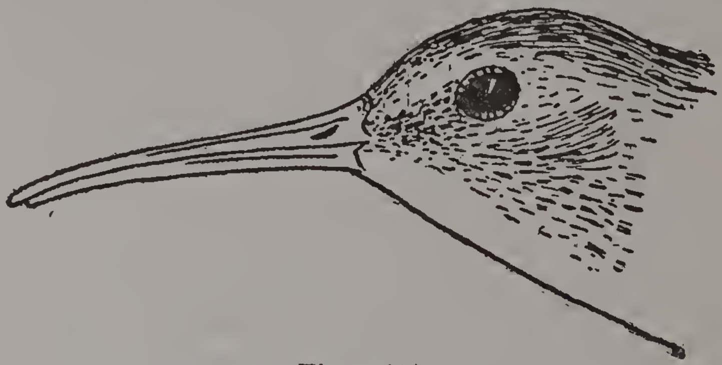


Figure 164
Bill of Red-backed Sandpiper; natural size.

Distinctions. In spring, the predominantly red back, and the black abdominal patch are absolutely distinctive. No other species has so much red on back. The coast form of the Purple has a blended dark area on the breast instead of the abdomen that does not cut sharply against the white above as it does on this species. The grey autumn plumage resembles that of several other species of similar size, but of them only the White-rumped and Sanderling ever show the clear, patternless (except for a few black and red-margined intrusive feathers), grey back. The former has a white rump, the grey of the latter is almost white, and the hind toe is absent. The other evenly grey-backed autumn Sandpipers—Knot, Wandering Tattler, and Surf Bird—are all so much larger that no mistake can be made. The moderately long (over 1¼ inches), slightly decurved bill is generally characteristic.

Field Marks. In spring, red back, and black abdominal patch contrasting sharply with nearly white breast. In autumn, small size, moderately long (longer than head) and slightly decurved bill, and patternless light grey coloration above.

Distribution. Eastern and western hemispheres. In America, across the Arctic, migrating down both coasts and through the interior. Common migrant in Manitoba, but authenticated records for Alberta and Saskatchewan are few. Not reported from interior of British Columbia, but common on the coast.

SUBSPECIES. The American Dunlin or Red-backed Sandpiper *Pelidna alpina sakhalina*, differs from the European race by its slightly larger size. It extends to the east Siberian coast.

This species frequents sand-bars, mud-flats or tide-meadows. It is among the latest Shore Birds to arrive both in spring and autumn.

246. **Semipalmated Sandpiper.** BLACK-LEGGED PEEP. *Ereunetes pusillus.* L, 6·30. Plate XVII B. Next to the smallest of our Sandpipers, being only slightly larger than the Least (page 139).

Distinctions. Except on the Pacific coast, to be confused only with the Least Sandpiper. Compared with that species, slightly larger. The best distinction is the partial webbing of the toes that give the name "Semipalmated" (Figure 165, compare with 163). Above, it is a greyer bird than the Least; the breast spotting is clearer and the white ground with less overwash. When overwash occurs it is greyish rather than buffy. Young birds may have slight buff breast band, but the stripes are almost absent on it. The bill is slightly longer and thicker than the Least and the legs black instead of olive green.

The Semipalmated is separated from the Western Sandpiper on the west coast with even greater difficulty than from the Least. The Semipalmated is smaller than the Western, but larger than the Least. The bill is considerably smaller (under rather than over 0·95 inch) (Figure 162), the back rarely has an appreciable amount of red, and the breast spots in comparable plumages are not so sharp and clear cut. In high spring plumage, the colour characters are plain, in autumn they are rather obscure; general size and size of bill make the best differentiation.

Field Marks. Away from the coast, to be confused only with the Least Sandpiper. Larger size, greyer back, and, in spring, more sharply-defined breast spotting. Legs black instead of olive green. From western by smaller size; in spring, by very much greyer back and less sharply-defined breast spots; in autumn, size when possible to make direct comparison is the best criterion. On the west coast, one of the earliest of the migrant Waders to arrive in the autumn.

Distribution. North and South America. Breeds on Arctic coast to mouth of Yukon. Migrates through the interior and on both coasts. Common nearly everywhere in migration. Probably the commonest and most widely distributed of the Peeps.

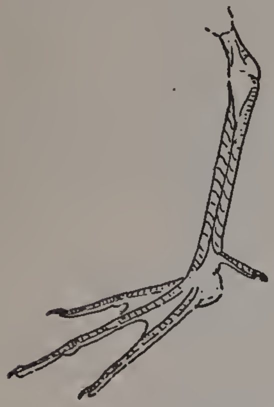


Figure 165
Foot of Semipalmated Sandpiper; natural size.

247. **Western Sandpiper.** WESTERN PEEP. *Ereunetes mauri.* L, 6·50. Like the Semipalmated Sandpiper but larger, especially in the length of bill. In spring and in most young autumn birds, back strongly red, even redder than the Least and with a well-defined reddish bar across nape.

Distinctions. Typical birds are easily recognized by their long bill (over 0·95 inch) (Figure 162), large intermixture of red in back and across nape, and the heavy, sharp spotting of breast. Many specimens, however, are not so easily recognized and it is only by the aggregate of various characteristics that they can be determined.

Field Marks. The largest "Peep," with bill longer than head, very red on back and with sharply-defined spotting on breast. Any one of these characters may be obscure or absent.

Distribution. North and South America. Breeds on northwest Alaskan coast. Of peculiar winter distribution. Occurs from California south and also on the Atlantic coast in migration as far north as New York, but as yet there are no records from the continental interior between and it is not known how they reach the extreme east from the far west coast.

248. **Sanderling.** *Crocethia leucophaea.* L, 8. In spring—upperparts, including crown, dark brown, variegated with much light rusty ochre, or white, or both. Below, white. Throat, neck, and upper breast overwashed with variable amounts of reddish-ochre spotted with brown. The details of these colourings are exceedingly variable. The back may show enough of the various colours to make it either generally greyish, ochraceous, or rusty, and the coloured and spotted throat may be nearly immaculate white. The autumn bird is similar without much buffy or any reddish or ochraceous tint, it is pure white below and in front, and often predominantly grey to light ashy above.

Distinctions. From traces to strong washes of rusty on neck and around head in the spring, and the general whiteness in autumn. The Sanderling may be told from all other Sandpipers by having three toes instead of four (Figure 166).

Field Marks. Rufous suffusion about the head in some spring birds, general contrasting black and white appearance on the wing. The line of white along the bases of flight feathers is probably the best field mark common to all plumages. The pure white breast in autumn is also characteristic.

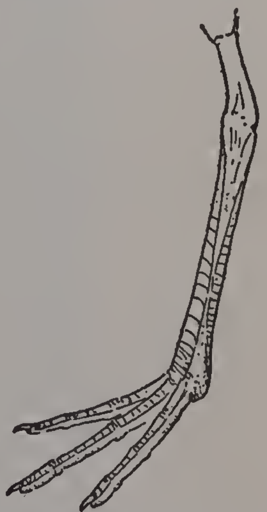


Figure 166
Foot of Sanderling; natural size.

Distribution. Breeds on the islands of the Arctic west to Alaska. A common migrant on sandy shores throughout Canada except interior of British Columbia where it is rather rare.

249. **Marbled Godwit.** *Limosa fedoa.* L, 18. Plate XVIII A. A very large, pink, buff, and brown Wader with long, slightly up-turned bill.

Distinctions. In general appearance much like the Curlews, but with slightly up-turned instead of decidedly down-turned bill. In colour, too unlike the Avocet, which also has an up-turned bill, ever to be confused with it. The only species it is likely to be confused with is its close relative, the Hudsonian Godwit. In spring, its breast is pinkish-buff instead of chestnut red. The wing quills are finely speckled or marbled with dark on pinkish-buff (Figure 167), instead of being solidly dark, almost black. The tail and its upper coverts are barred with the pinkish-buff and dark, instead of the tail being practically black and coverts white.

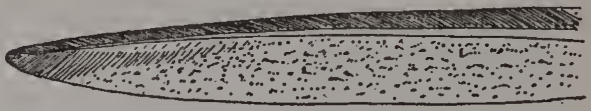


Figure 167
Marbled Primary of Marbled Godwit; scale, ½.

In autumn, the Marbled Godwit is of the same general coloration as in spring, but slightly pinker and without the fine breast vermiculation. The autumn Hudsonian Godwits are almost pure white below with uniform shades of ashy elsewhere, though traces of the spring plumage often persist in the adults.

Field Marks. A large ochraceous and brown Wader. Long, up-turned bill, yellow orange at the base in spring, flesh pink in autumn, separates it from the Curlews; and general coloration and evenly-coloured rump and tail of ochraceous barring from the black-tailed, white-rumped Hudsonian. Wings largely ochre instead of solid black.

Distribution. North America. In Canada, it breeds on the prairies. Rare in the interior of British Columbia, more common on the coast in migration.

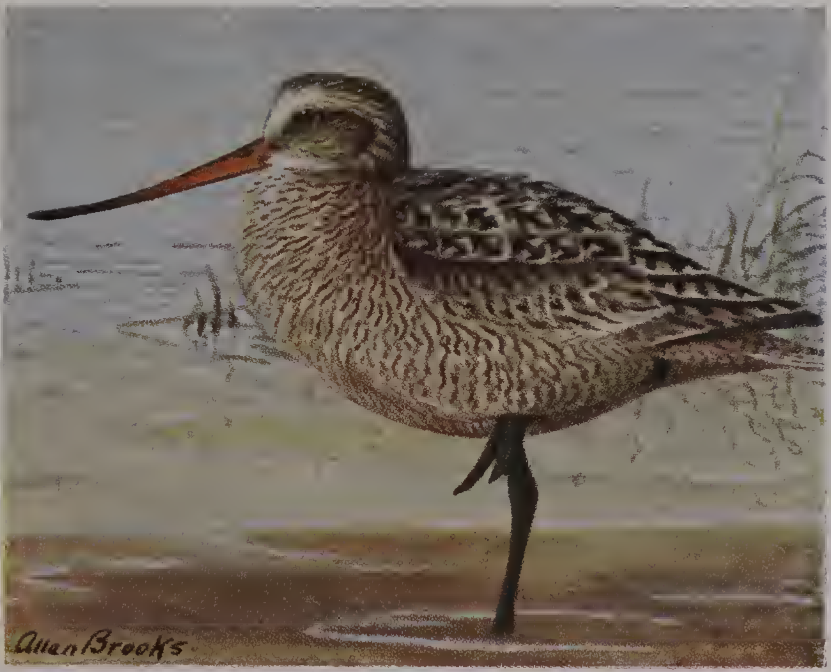
A very conspicuous prairie bird. One cannot come within half a mile of its nest without both birds hurrying excitedly from afar, scolding and diving at the intruder. Their loud, exasperating "*eradica-radica-radica-radica*" varied with "*Your-crazy-crazy-crazy*" and confirmed by vociferous "*korect-korect*" sets all the prairie on the alert. The Godwit often becomes a decided nuisance to the ornithologist who is quietly stalking other and shyer species and finds his efforts fail through the senseless alarm of this meddler. However, it is only on such special occasions that we are aggrieved at this Godwit. At other times we feel only impatience at the heedless busy-bodies that rush into unnecessary danger and advertise what they should most artfully conceal. Too often this Godwit suffers from its lack of self-control, for it offers a most tempting shot to the pot-hunter; an opportunity that is taken advantage of often enough to threaten the existence of the species.

251. **Hudsonian Godwit.** *Limosa haemastica.* L, 15. In spring—upperparts, dark brown to crown, marked with more or less greyish or buffy and touches of rusty; underparts, reddish brown, more or less barred with dark, and suffusing up foreneck. Autumn—upperparts unmarked brownish grey; underparts, buffy white or dingy white, breast greyer.

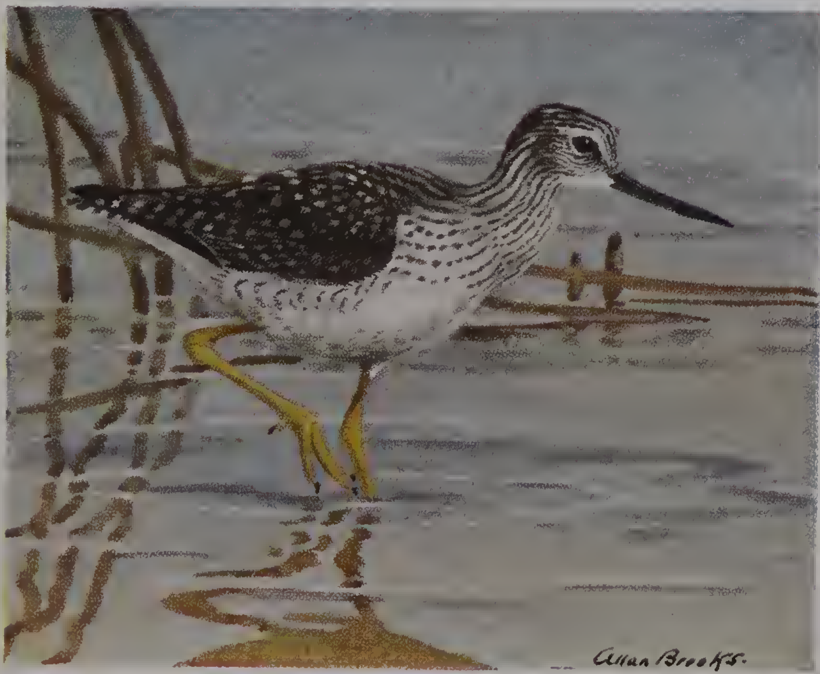
Distinctions. Distinguished from the Curlews by the slightly turned-up instead of distinctly turned-down bill; from the Marbled Godwit by the red underparts in spring, and at all seasons by the all-dark, white-shafted primaries without marbling (compare with Figure 167) and white uppertail coverts. This species shows almost endless variation between the above plumages, but suggestions of the spring coloration are usually recognizable in all except young birds.

Field Marks. Large size, straight or slightly turned up bill, and white coverts at base of black tail, will separate this from either the Curlews or the Marbled Godwit which are the only species that are likely to be confused with it.

Distribution. North and South America. Breeds in the north from Mackenzie valley eastward. Migrates through the prairies and the east, south to Patagonia.



A. Marbled Godwit; scale, $\frac{1}{4}$


Allan Brooks.

B. Greater Yellow-legs; scale, $\frac{1}{4}$
Juvenile

The Hudsonian Godwit is a fine bird on the verge of extinction. As frequently happens, it seemed to disappear suddenly and before its growing scarcity was realized. It is doubtful whether shooting in this country was altogether responsible for this condition. When a species is greatly reduced in numbers by any cause, an otherwise comparatively unimportant adverse influence may suffice to snuff it out unexpectedly. Protection is ineffective when delayed so long that the breeding stock is too greatly reduced for recovery. This Godwit disappeared before serious effects of western settlement could have occurred, and we can console ourselves with the reflection that its disappearance was probably due mostly to conditions on the Argentine pampas and in its winter quarters.

262. **Buff-breasted Sandpiper.** *Tryngites subruficollis.* L, 11·50. A small, buff-coloured Sandpiper. A soft, light buff all below, strongest on breast. Above, from tail to crown, dark brown, nearly black, feathers heavily edged with light ochre. No conspicuous markings anywhere.

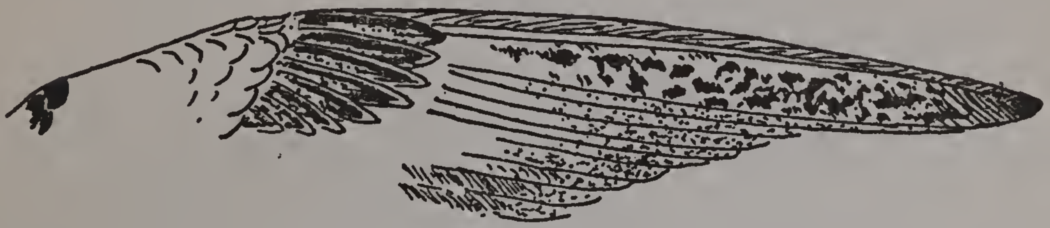


Figure 168
Under-wing surface of Buff-breasted Sandpiper; natural size.

Distinctions. The only small Sandpiper (about the size of Spotted) so evenly and extensively buff-coloured. Further distinctions found on the underwing surface, which is mostly white but beautifully mottled and marbled with black (Figure 168), a character exhibited by no other Shore Bird.

Field Marks. As a rule an upland bird, but often seen with other Waders on the shores. A round-headed, short-billed (bill shorter than head), buffy little Wader, with dull yellow legs. Because of its upland habitat unlikely to be mistaken for anything except the Pectoral Sandpiper, but the buffy below is uniform and continuous over the underparts and not contrasted with white throat and abdomen. On the beaches the species it is most likely to be confused with is Baird's Sandpiper; but it is more buffy, especially below, is without white throat, and has larger and rounder-appearing head.

Distribution. North and South America. Breeding on the Arctic coast, west of Hudson bay. Migrates in limited numbers through the Prairie and Eastern Provinces of Canada. Occasional records from the coast of British Columbia.

This is one of the rarest of the generally distributed Sandpipers. We have scattered records of it right across Canada from practically everywhere except Saskatchewan and the interior of British Columbia. Its absence from the former province is probably more apparent than real, as it has been taken on both sides and to the south. There is some doubt as to whether it ever was very common in the west, but it has certainly become less numerous of late years and instead of occasional large flocks only singles or small companies are now reported.

Subfamily—Numeniinae. Tattlers and Curlews

254. **Greater Yellow-legs.** GREATER TELL-TALE. *Totanus melanoleucus.* L, 14. Plate XVIII B. A large, graceful Wader, practically black and white in fine pattern, with long, yellow legs.

Distinctions. Size, long yellow legs, and the lack of any buffy or rusty anywhere mark the Yellow-legs. In autumn, the breast marks may be veiled and indistinct. Almost identical in coloration with the Lesser Yellow-legs from which it is best separated by size. The bill of this species, especially the lower line of the under mandible, is very slightly upturned, but that of the Lesser is straight (Figure 169, compare with 170).

Field Marks. Long, slender, yellow legs, entire lack of ochraceous or warm brown colours, and the large amount of white on tail and rump. When once acquainted with it, its flight is quite recognizable and its musically whistled notes are very distinctive. The two Yellow-legs are separable by size and by the slightly upturned bill of this species.

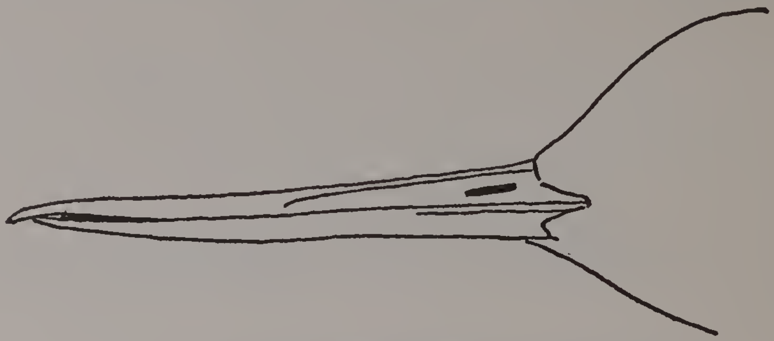


Figure 169
Bill of Greater Yellow-legs; natural size.

Distribution. North and South America. Breeds across the continent, from the north edge of the prairies and central British Columbia northward. Migrates throughout southern Canada. Both Yellow-legs, together with the Solitary Sandpiper, have the strange habit of nodding and teetering. This consists, at irregular but frequent intervals, of a quick, spasmodic nodding of the head, or a momentary flexure of the legs and a simultaneous tilting upward of the tail. The nodding in these species is far more common than the teetering. It is indulged in at all times and in nearly all circumstances. Even when in repose, ever so often a slight nodding movement of the head can be observed; but when excited and nervous, scarcely a movement can be made without being preceded by an involuntary dip, and in pauses between action or in moments of irresolution the nodding becomes almost frantic.

The Greater Yellow-legs is one of the best known Shore Birds. Owing to its size and comparative numbers it is sought after by sportsmen and it seems to have withstood their attacks better than many other apparently equally well-adapted species. The two Yellow-legs are amongst the few Shore Birds that may be legitimately hunted under the terms of the Migratory Birds Convention Act. The Greater prefers marshy shores and mud to open sand and may be seen far out on the flats, wading about thigh deep, in water too deep for smaller Waders. Its clear, flute-like, tremolo whistle in a descending scale is a sound to accelerate the pulse of any true sportsman or bird student. This species does not seem so numerous as, and is certainly more wary than, the Lesser Yellow-legs; otherwise this description will do for both.

255. **Lesser Yellow-legs.** LITTLE TELL-TALE. *Totanus flavipes.* L, 10·75. Almost exactly like the Greater Yellow-legs, but smaller in size (*See* Plate XVIII B).

Distinctions. Ordinarily, distinguished from the Greater Yellow-legs only by smaller size. Careful comparison will show that the bill is perfectly straight, whereas that of the Greater is very slightly up-turned (Figure 170, compare with 169).

Field Marks. Long, slender, yellow legs; entire lack of ochre or brown in coloration and large amount of white in tail and on rump will identify it as one of the two Yellow-legs; smaller size and perfectly straight bill as the Lesser. The Lesser Yellow-legs has the same nodding and teetering habits of the Greater, which see.

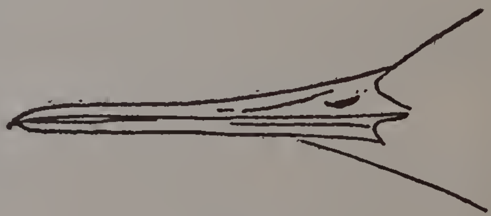


Figure 170
Bill of Lesser Yellow-legs·
natural size.

Nesting. On the ground.

Distribution. North and South America. Breeds from the northern edge of prairies and probably central British Columbia northward. Migrates throughout southern Canada. The breeding ranges of these two Yellow-legs are not very well delimitated. *See* previous species.

256. **Solitary Sandpiper** (Including **Western Solitary Sandpiper**). *Tringa solitarius.* L, 8·40. A small Sandpiper of same general colour design as the Yellow-legs (*See* Plate XVIII B) but much smaller; back darker, less mottled with light; rump same colour as back; less white in tail.

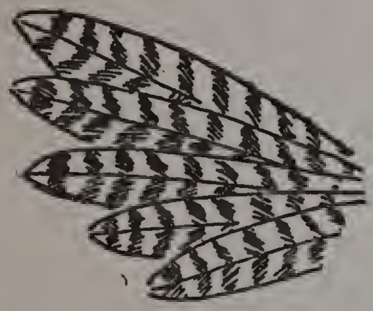


Figure 171
Barred axillars of Solitary Sandpiper; natural size.

Distinctions. Back dark brown, almost black with slight green sheen, but finely speckled with white, ochre, or rusty-ochre spots. The best specific distinction is barring of the axillar feathers under the wing (Figure 171), which occurs in no other comparable species.

Field Marks. A small black and white Sandpiper with the same nodding habits as the two Yellow-legs (which see), but not the constant body-teetering of the Spotted Sandpiper, with which it is most likely to be confused. It nods continually but teeters only occasionally, instead of the contrary. It is also without the white bars on the wing that are so conspicuous in that species in flight, but shows more white barring on the tail. The flight is a long sweeping wing-beat more like that of the Yellow-legs than with stiff, down-curved wings like the Spotted.

Nesting. The nesting of this species was unknown until it was discovered recently that it builds in old nests of Robins and other birds in bushes at some distance from the ground, as does the Green Sandpiper of Europe.

Distribution. North and South America. Presumably breeding across the continent, but actual nesting instances are rare. Northern and western Alberta and northern Saskatchewan have the only well-substantiated records as yet. In migration more or less common throughout southern Canada.

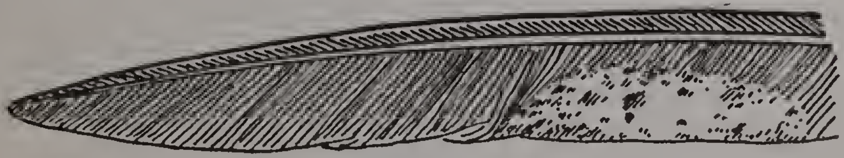


Figure 172
Marbled primaries of Western Solitary Sandpiper, from below; natural size.

SUBSPECIES. Two subspecie of the Solitary Sandpiper are recognized. The Eastern Solitary Sandpiper *Tringa solitarius solitarius* occupying most of the continent and the Western Solitary *Tringa solitarius cinnamomeus* from the eastern sides of the mountains west. In migration both forms occur throughout British Columbia and Alberta and the breeding distribution of the two forms is not well defined. The Western Solitary is characterized by slightly larger size, white spotting on back being more or less tinged with rusty-ochre in juvenility, and white marbling or blotching on base of under surface of first primaries (Figure 172). This latter, although it may not be present in all *cinnamomeus*, probably never occurs in Eastern *solitarius*. None of these subspecific characteristics are absolutely determinative and an average of them should be sometimes taken in identification.

As implied by the name, this species is a rather solitary bird, being found, even in migration time, in individuals or pairs rather than in flocks. It is a mud haunter and is the only Wader except the Spotted Sandpiper that is commonly seen about such small waters as drainage ditches, or along the edges of flooded woods.

258. **Willet** (Including **Western Willet**). *Catoptrophorus semipalmatus.* L, 15. Plate XIX A. A large, grey Shore Bird with white rump and pale tail and a conspicuous white bar across the wings.

Distinctions. There is no other species with which the Willet is likely to be confused. The general greyish and white colour and conspicuous black and white wings are perfectly distinctive even if the large size of the species be not sufficient identification.

Field Marks. A large grey and white Wader with white rump and tail, and in flight with a flaring white bar across black wings.

Distribution. North and South America. Breeding from Nova Scotia in the east and the prairies in the west, southwards. Only a single record, from near Victoria, for British Columbia.

SUBSPECIES. The Willet of the west is the Western Willet *Catoptrophorus semipalmatus inornatus*, the type form, *Catoptrophorus semipalmatus semipalmatus*, being confined to the Atlantic coast. The western bird is slightly paler than the eastern one.

The case of the Eastern Willet has furnished us with a good object lesson in what may be accomplished by practical conservation. Up to a few years ago the Willet was deemed extinct north of Virginia. About 1916 the existence of a few breeding pairs on the Nova Scotia coast was called to our attention. Efforts to preserve them were made by special officers, admirably seconded by local residents, especially the late H. A. P. Smith, of Digby. The birds began to increase immediately and the future of this once depleted race is promising. The Western Willet is not an uncommon bird on our prairies today, but, like the Godwit and the Long-billed Curlew, it offers great temptation to the occasional pot-hunter, and unless he can be controlled it is doubtful how long the Willet will survive in appreciable numbers. It is one of the three big Waders that are so characteristic of the great prairies, the other two being the Marbled Godwit and the Long-billed Curlew. It loves to stand on the edge of the muddy water and raise its striking black and white wings, banner-like, over its back, and pose spectacularly. Passing by in the bright sunshine, its white barred wings flash like a heliograph message. The most characteristic note is a long, musically whistled "*Pill-will-willet*". Sometimes this is heard on a still night, and when broken and softened by distance it sounds remarkably like the mournful plaint of the Whip-poor-will.

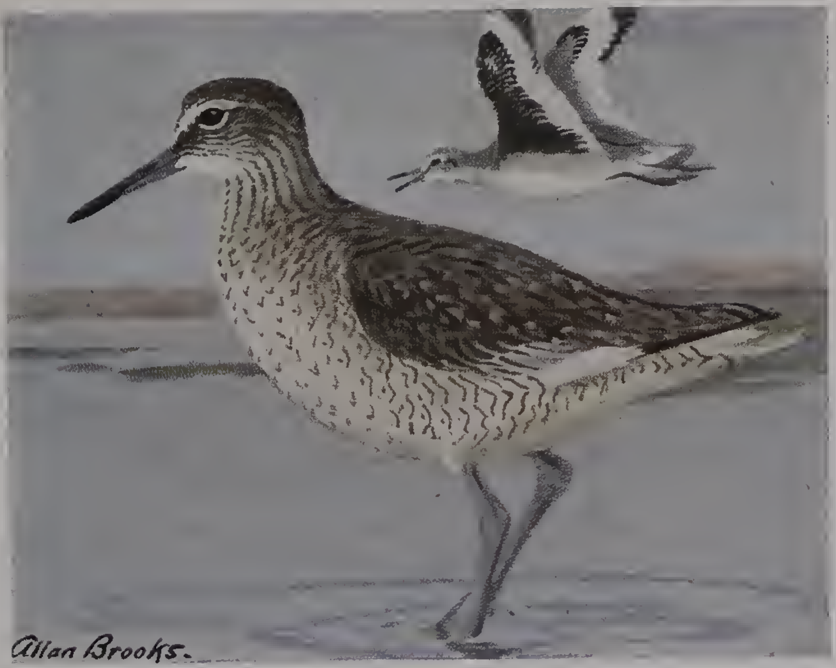
259. **Wandering Tattler.** *Heteroscelus incanus.* L, 10·50. A rather large, grey Wader. The adult is an even slate grey above, from tail to crown, without pattern or design. Below and flanks white, closely crossed with irregular bars of the same colour as the back, changing to fine stripes up foreneck and sparse speckles on throat. The juvenile is similar, but the barring below is replaced by a suffusion of even light grey on flanks, across breast, and up foreneck.

Distinctions. In spring the heavy grey barring below is mistakable for no other species. The Stilt Sandpiper is the only other Wader with breast so barred, but it is much smaller and the colour is warm brown instead of slate grey. In juvenility, the Wandering Tattler is rather like an autumn Knot, but the grey is decidedly darker, plumbeous rather than ash-grey, with practically no pattern, and the rump is the same colour as the tail and back. The autumn Surf Bird has also a general resemblance to the autumn Tattler, but has a white rump, considerable white in the wings, a well-streaked throat, and a closely spotted or striped breast.

Field Marks. A rather large grey Wader; adult heavily barred below. Juvenile, white below with faint breast suffusion, but no other conspicuous characters. Bill rather longer than head.

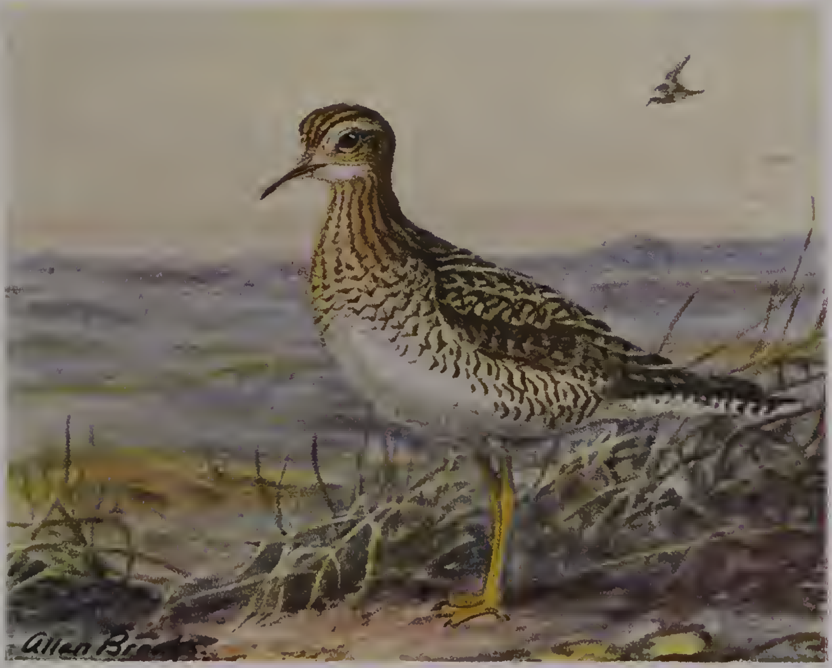
Distribution. Rocky coasts and islands of the Pacific. It breeds in interior of Alaska and the Yukon, but its nest has only lately been found. It migrates down our British Columbia coast, but never occurs inland except as noted above. A purely maritime species except in the breeding season when some at least seem to go inland to nest; at other times it is confined to rocky shores.

PLATE XIX


Allan Brooks.

A. Willet; scale, $\frac{1}{4}$

Winter adult Summer adult


Allan Brooks.

B. Upland Plover; scale, $\frac{1}{4}$

261. **Upland Plover.** BARTRAMIAN SANDPIPER. QUAILY. *Bartramia longicauda.* L, 11·50. Plate XIX B. A rather large ochraceous Shore Bird inhabiting the upland fields and prairies.

Distinctions. About the size of a Greater Yellow-legs with a bill rather shorter than the head, and strongly ochraceous in colour. It can hardly be confused with any other species. The first primaries are saw-toothed, marked with dark on a ground of white (Figure 173). The much larger Long-billed and Hudsonian Curlews are the only other Shore Birds with this wing-quill saw-toothing (*See* Figures 174, 175), but the ground colour is buff instead of white.

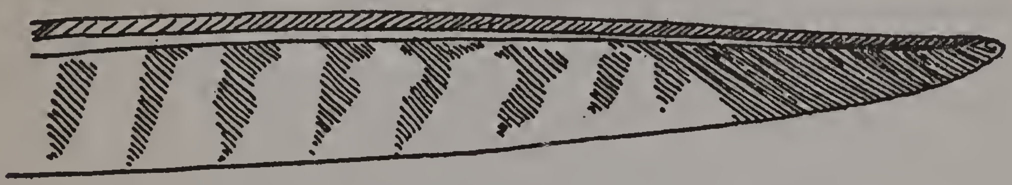


Figure 173
First primary of Upland Plover, from below; natural size.

Field Marks. A rather large, buff-coloured Wader with bill about as long as head, much smaller than either the Curlews or the Godwits. Unlike other Shore Birds, it inhabits high ground. On the ground it has a short-legged, round-headed appearance and an action that suggests a young Prairie Chicken rather than a Wader.

Distribution. North and South America. Breeding irregularly and locally across the continent from far south of the border, north to Alaska and southern Mackenzie.

Though the name Plover is commonly accepted, this species is a true Sandpiper, aberrant in habit, having deserted the shores and mud-flats for the dry uplands. The term Bartramian Sandpiper is a more satisfactory name, honouring a great ornithologist and expressing the true relationship of the bird. It is one of the most attractive of the prairie inhabitants. It has long, loud, clear whistles, variously modulated, which it gives in the spring and early summer. Sometimes these notes are accompanied by a remarkable dance flight; at other times given from the ground or some slight elevation such as the top of a fence post, where, with wings raised over the back, it poses in statuesque grace. It is a confirmed grasshopper destroyer and is probably worth much more in that capacity than as an article of food.

263. **Spotted Sandpiper.** PEWIT. PEET-WEET. TEETER. TIP-UP. *Actitis macularia.* L, 7·50. Plate XX A.

Distinctions. Adults have decidedly round breast spots and a slight greenish lustre on the back. Young autumn birds resemble the Solitary, but are distinguished by white instead of barred axillars (compare with Figure 171).

Field Marks. Size and distinct round spots on breast. When flying it may be distinguished from the Solitary Sandpiper, which it most resembles, by the white line along the ends of the secondaries and the much smaller amount of black and white barring on the tail. The Spotted Sandpiper teeters constantly, whereas the Solitary nods, and teeters only occasionally. In this queer, spasmodic action, which seems more or less involuntary, the legs are momentarily flexed and the forepart of the body is jerked down as the tail is jerked up. This action is indulged in continually. Standing at ease on a stone at the water's edge it teeters; every pause in its little excursions is filled with a succession of teeters; and it stops even in full career to punctuate with a teeter. Its wing stroke is distinctive; its stiffly held, down-curved wings at the bottom of each stroke being very different from the long, flowing beat of any other similar Wader.

Nesting. Slight hollow in ground at no great distance from water in the shelter of a clump of shrub or bunch of grass.

Distribution. Breeds over the whole of Canada north to tree limit. Common throughout its range.

This is the commonest summer Sandpiper in Canada; occasional pairs are to be found along the smallest streams. It frequents all kinds of ground; sand beaches, gravelly reaches, mud-flats, or rocky shores. Almost any small Sandpiper seen in summer near our waters may be provisionally put down as this species unless there are good grounds for other identification. Its habit of bobbing its body up and down occasionally, even when apparently at rest, or more rapidly when excited, has given it the common name "Tip-up." Its white-barred wings, peculiar flight, with a few quick beats followed by a short sail on decurved wings, and its loud triumphant ''*Pewit-pewit-pewit*'' as it alights on the stream margin well ahead of the observer are familiar to all. One can chase it from point to point for some distance from its home ground, when, joined by its mate, it will circle well around the disturber and return to the place from which it started.

Economic Status. Though normally frequenting water edges it is often seen in the adjacent fields, running between the furrows of newly turned earth or rows of growing plants. Its food consits mainly, if not entirely, of insects; hence it is beneficial to the farmer. The species has not suffered from shooting, probably because of its small size and non-flocking habits, and it seems to hold its own even in the most cultivated sections.

264. **Long-billed Curlew.** SICKLE-BILLED CURLEW. *Numenius americanus.* L, 24. The largest of our Waders, varying considerably in length owing to the growth of the long, decurved bill. All below pale, pink-buffy, lightening to cream on throat and face. Flanks lightly striped with brown which extends sparsely across breast and more thickly and finely up and around neck to face and crown. Above, dark brown and the same pink-buffy of the lower parts in complicated mottling and barring.

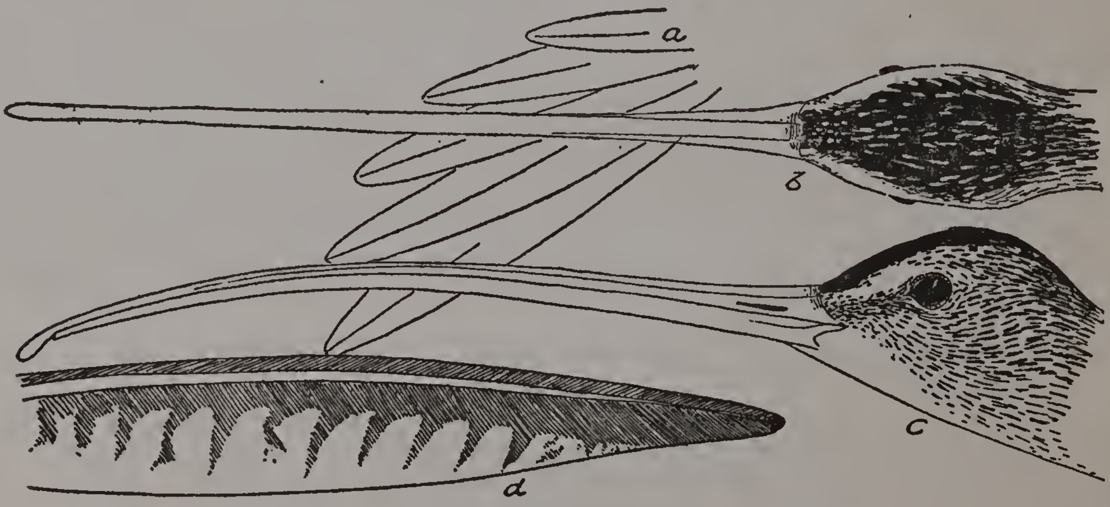


Figure 174

Specific details of Long-billed Curlew; scale, ½.

a, plain axillars; *b*, crown without median stripe;
c, profile of head; *d*, tooth-marked first primary.

Distinctions. The long, decurved bill and buffy coloration are distinctive of the Curlews. Too large to be confused with the Eskimo Curlew, but very similar and nearly intergrading in length with the Hudsonian. Its distinctive characters are plain, unbarred, pink-buff axillars which separate it from both the other Curlews; saw-tooth markings on the primaries separate it from the Eskimo; and an evenly striped crown instead of one showing a well-defined median line distinguishes it from the Hudsonian (Figure 174, compare with 175 and 176). As the bills of Curlews continue to grow for some time after apparent maturity, they are rather variable in length, but any Curlew with a bill over 4 inches long is probably this species.

Field Marks. Large size, buffy colour, and long decurved bill for a Curlew. Size is the best criterion in distinguishing the Long-billed Curlew in life from the Hudsonian. In general, it is more pink in colour, especially under the wings, the Hudsonian being more of an olive brown. Anywhere in southwestern Canada the summer Curlew is the Long-billed, the Hudsonian being only a spring and autumn transient.

Distribution. North America. Breeds along our southern border and southward from the interior of British Columbia to Manitoba. Has almost disappeared from eastern and western extremes of its range and only locally common elsewhere. We have several records from the British Columbia coast.

The finest of the Shore Birds. Not so spectacular in colour as the pink and white Avocet or the banner-winged Willet, but with a picturesque distinction of its own, and of sufficient size to make it conspicuous. The powerful flight on long, pointed wings; the clear-cut, distinctive outline, long sickle-bill extended and legs trailing; and the exultant, care-free whistles, clear, musical, and prolonged, unite to make this a notable bird that embodies the spirit of the open range more than any other bird, and one that cannot fail to arouse enthusiasm in the sympathetic observer.

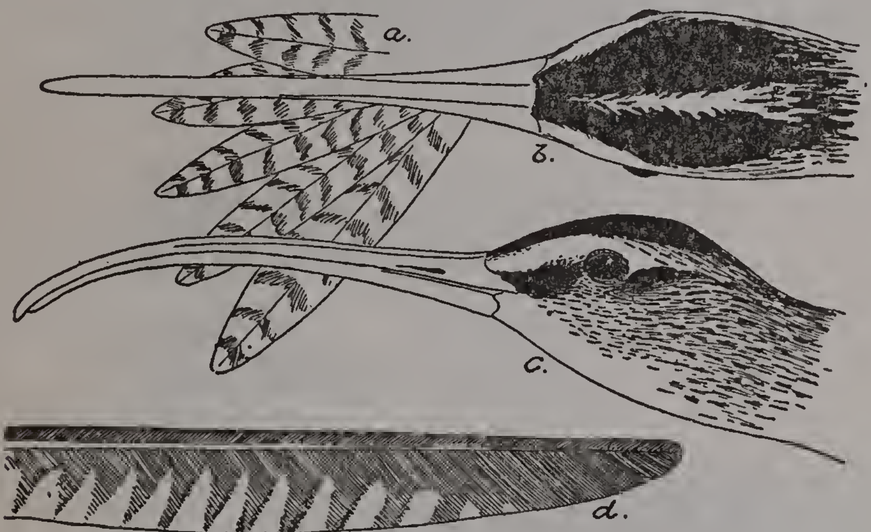


Figure 175

Specific details of Hudsonian Curlew; scale, ½.

a, barred axillars; *b*, median crown stripe;
c, profile of head; *d*, tooth-marked first primary.

The commonest call note is a clear "*Pil-will,*" so nearly like that of the Willet that it can not always be distinguished from it. Other notes resemble those of the Upland Plover. One especially delightful is a long-drawn "*Curl-e-e-e-e-u-u-u,*" sparklingly clear and rising in the middle about five notes, then dying gradually away, lowering in scale and volume. The entire call lasts about three seconds of time. As these birds alight they run along the ground a few yards, with their ample wings still raised straight over their backs, uttering their long whistle. Like the Godwit they build their nests on the uplands at some distance from water and it is not until the young are hatched that they seek the edges of the pools and resume wader-like habits.

Whether we can retain such a large and conspicuous bird in settled country remains to be seen; this rests largely with the popular feeling of the communities they inhabit. Much said on this subject under the headings Avocet, Godwit, and Willet applies equally well to the Curlew.

265. **Hudsonian Curlew.** *Numenius hudsonicus.* L, 17. A smaller Curlew than the last, but a larger one than the next. A very large Shore Bird of general buffy colour with long, decurved bill. It varies considerably in over-all length, owing to growth of bill. Buffy below, creamy rather than pinkish, whitening on throat and face. Above, rather faded brown, more or less intermixed with the buffy of below. Brown barring the flanks and striping the breast up the neck to face.

Distinctions. With the Eskimo Curlew superficially distinguished from the Long-billed by being more olivaceous than pinkish in general cast and more heavily striped on breast and throat. The Hudsonian Curlew has saw-tooth markings on the primaries like the Long-billed; barred axillars like the Eskimo, but with a pronounced light median crown stripe, absent in either of the others (Figure 175, compare with 174 and 176). This combination of characters is always determinative. A Curlew with bill under 4 and over 2·4 is likely to be this species.

Field Marks. Large size, buffy colour, and long decurved bill for a Curlew. Owing to distribution not likely to be mistaken for any other species, as it does not occur commonly in Canada where Long-billed may be expected. It is, however, a smaller bird than that species; less pink and more olive-brown. The colour characters are especially conspicuous on the underwing surface in flight. The Eskimo Curlew is too rare a bird today and too similar to be separated from the Hudsonian in life, by field observation.

Distribution. North and South America. Breeds on the northwest coast of Alaska and the coast of Mackenzie. Migrates through the big lakes of Mackenzie and eastern Canada and along the Pacific coast. Not noted, as yet, in the interior of British Columbia and only a few times in the Prairie Provinces.

266. **Eskimo Curlew.** *Numenius borealis.* L, 13·50. The smallest of our Curlews, almost identical in general form and colour with the Hudsonian.

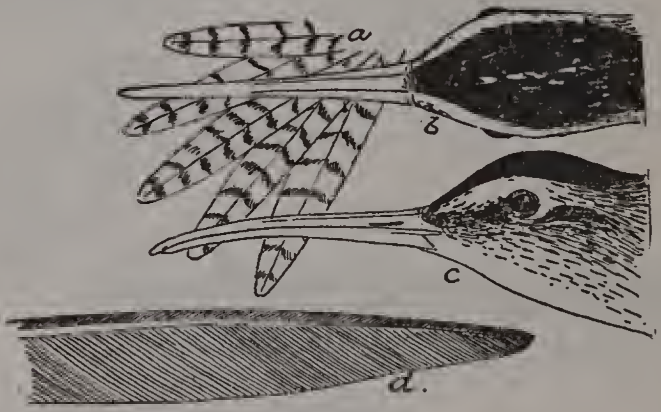


Figure 176
Specific details of Eskimo Curlew; scale, ½.
a, barred axillars; *b*, crown without median stripe;
c, profile of head; *d*, plain first primary.

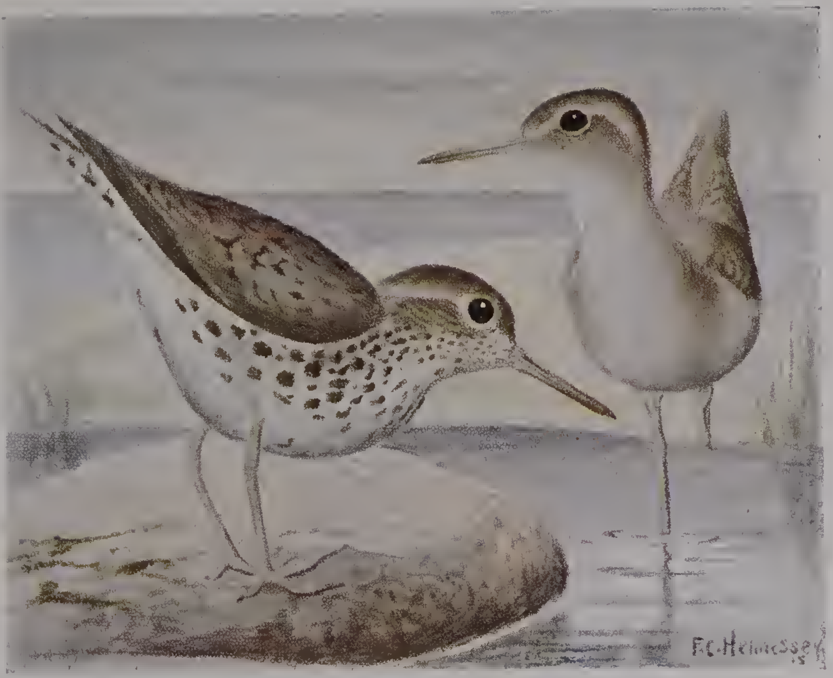
Distinctions. Like the Hudsonian but smaller, crown mottled but without well-defined median stripe, primaries plain without saw-tooth pattern and axillars barred (Figure 176, compare with 174 and 175). This combination of characters is determinative. A Curlew with bill under 2·25 is probably this species.

Field Marks. Like a very small Hudsonian Curlew, but too rare today to be recorded on field identification.

Distribution. North and South America. Breeds on the Barren-grounds of Mackenzie, migrates through eastern Canada and down the Mississippi valley. We have no actual records for our Prairie Provinces, but these Curlews have been taken on Great Slave lake and were once numerous in the Missouri River region.

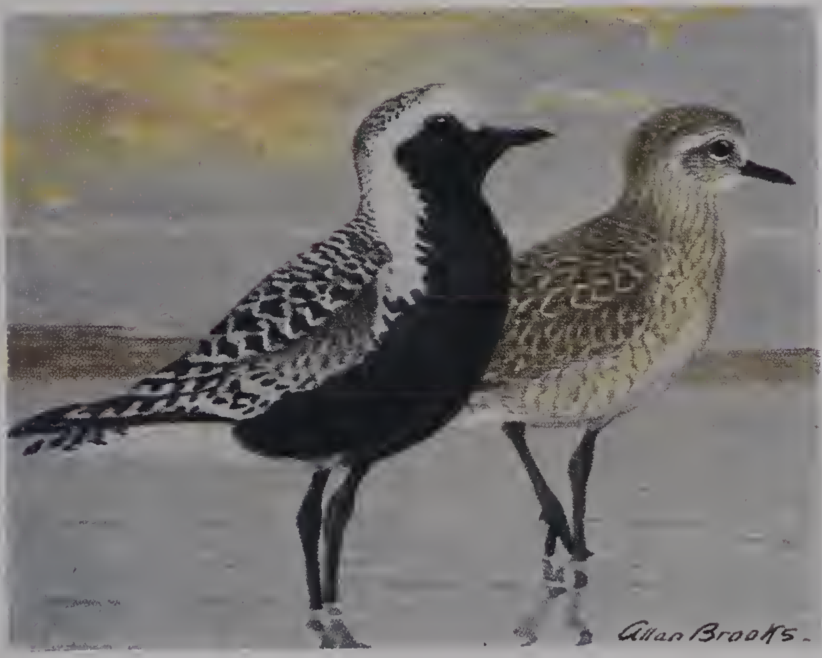
Once noted for their vast numbers, and Audubon compared the flocks with those of Passenger Pigeons. Now nearly extinct. No doubt market hunting in the southern States was an important factor in their depletion as they were marketed from the Gulf Coast regions by the hundreds of dozen brace. As in many such cases the bird seemed to disappear suddenly, about 1892, and it was not until it was practically gone that any general

PLATE XX



A. Spotted Sandpiper; scale, $\frac{1}{2}$

Adult Juvenile



B. Black-bellied Plover; scale, $\frac{1}{4}$

Summer adult Autumn juvenile

alarm was expressed concerning it. We do not note the gradual depletion of any species, or if we do observe it we are prone to ascribe it to local instead of general conditions and it is not until many observers begin to compare notes that the true conditions are realized. All species have their bad and good seasons, epidemics, and other periodical setbacks. When there is a large natural reserve of numbers, such checks make no permanent inroad on the strength of a thriving species, but when a steady, even, though slow, reduction is in progress, checks normally of minor importance become catastrophic.

FAMILY—CHARADRIIDAE. PLOVER

General Description. The Plover are rather more stoutly and compactly built than the snipe-like birds. Their bills are shorter, soft at the base, but ending in a hard, horny tip (Figure 16, page 25). Hind toe lacking in all species except Black-bellied in which it is very small and almost rudimentary.

Distinctions. With the above description the Plover are not likely to be confused with other families.

Nesting. On the ground in a slight depression usually lined with scanty grass, moss, waste vegetation, or pebbles.

Distribution. The family, in closely related or nearly identical forms, is circumpolar in distribution, breeding mostly north of present settlement.

The Plover are well known to the sportsman. They average larger in size than the Snipe and some of them that feed in upland fields offer considerable sport.

Economic Status. As a family they frequent cultivated land more than other Shore Birds and hence are of somewhat greater economic interest. They are actively helpful to man.

270. **Black-bellied Plover** (Including **American Black-bellied Plover**). BULL-HEAD. *Squatarola squatarola.* L, 11. Plate XX B. In spring and summer—above, checked black and white; below, face, throat, and breast, solid black. Crown mostly white. Juvenile: above to crown, a dark ground, finely speckled with cream or yellow; all below white; flanks, breast, foreneck, and face, softly striped with greyish brown. Adult birds in winter wear a plumage somewhat similar to that of the juvenile, but in early autumn are still partly in the summer coat. Most of the white may be worn off the upper parts and the black below is dull and mixed with the white of the incoming winter plumage.

Distinctions. Like the Golden Plover, but somewhat larger. At all seasons it resembles that species in colour, but differs as follows: In spring, decidedly more white than black above, especially on crown which may be nearly immaculate, instead of the converse. The white of the back at this season is not at all yellow. Below, rear abdomen and under-tail coverts, white instead of black. The juvenile is never as yellow above as the typical Golden Plover and the markings are considerably coarser and more blended. The breast pattern is in stripes, blended more or less, never with the suggestion of crossbarring as in the Golden. In any plumage, may be distinguished from the Golden by white or very light rump, black, instead of grey axillars, and the presence of a rudimentary hind toe (Figure 177, compare with 178).

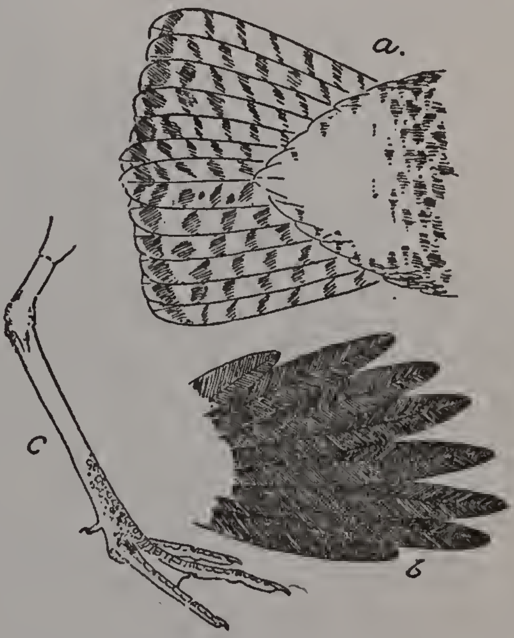


Figure 177
Specific details of Black-bellied Plover; scale, ½.
a, white rump; *b*, black axillars; *c*, rudimentary hind toe.

Field Marks. In spring, the Black-bellied Plover, with extensive black underparts, may be confused only with the Golden. Its whiter head and back make the best distinctions when the bird is still. On the wing, the black axillars stand out plainly against the grey ground of the underwing, and the white rump is conspicuous. In juveniles and autumn birds, the striped instead of faintly barred breast, black axillars, and white rump are the best field marks. The notes are quite distinctive, but must be heard before the difference can be appreciated.

Distribution. Nearly cosmopolitan. In America, breeding along the Arctic coast west of Hudson bay. Migrates throughout all southern Canada.

SUBSPECIES. The American Black-bellied Plover has been separated from the European bird lately under the name of *Squatarola squatarola cynosurae.*

This is one of the finest Plovers and one of the few Shore Birds on which there is an open season.

272. **Golden Plover** (Including **American** and **Pacific Golden Plover**). *Pluvialis dominicus.* L, 10·50. In general coloration and appearance almost exactly like the Black-bellied Plover (*See* Plate XX B), but slightly smaller. In early autumn, adults with blotched plumage, changing from summer to winter pattern, may be the same as that species.

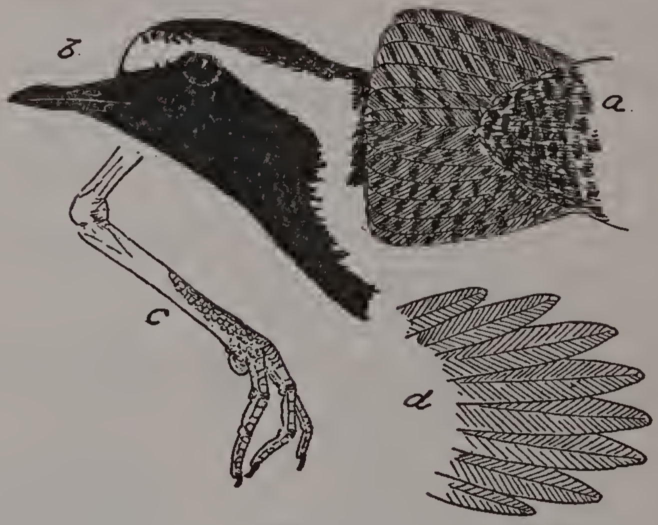


Figure 178

Specific details of American Golden Plover; scale, ½.

a, dark rump; *b*, dark crown;
c, no hind toe; *d*, grey axillars.

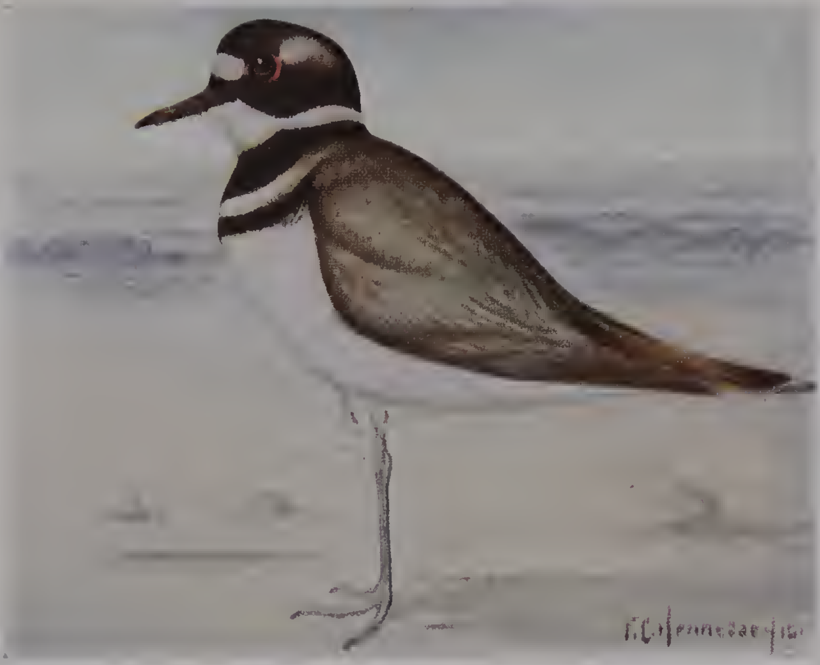
Distinctions. Likely to be confused only with the Black-bellied Plover whose plumage sequence it follows closely, with the following differences. In spring, decidedly more black than white above and the light speckles strongly golden yellow. Crown almost solid black instead of nearly pure white. Below, the black includes the undertail coverts. The adults in winter are very similar to the juvenile which is generally quite yellow on back, the colour suffusing over face and breast. The markings above are considerably finer and sharper than on the Black-bellied, and those on breast and flanks tend towards faintly suggested bars instead of stripes. In any plumage, the Golden Plover is to be known from the Black-bellied by its rump, unicoloured with the back, dark tail, grey instead of black axillars, and the absence of even a rudimentary hind toe (Figure 178, compare with 177).

Field Marks. In spring the Golden Plover with extensive black underparts can be mistaken only for the Black-bellied. Its dark crown and back make the best distinctions when the bird is still. When it is on the wing the axillars, evenly grey with the under surface of the wing, and absence of white rump, are quite conspicuous.

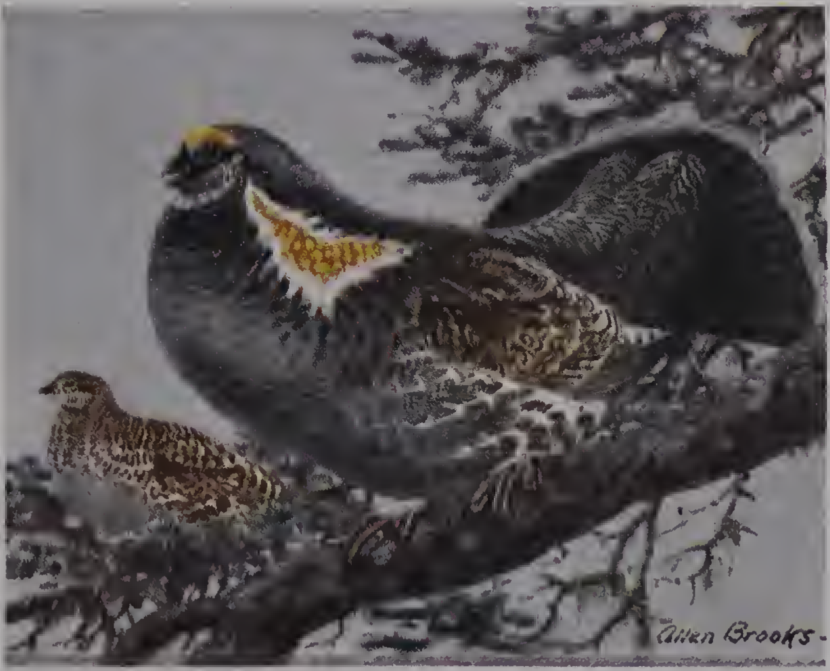
In the juvenile, the faint indications of barring on breast, and the underwing and rump marks are the best field marks. The notes are also quite different, but must be heard before the difference can be appreciated.

Distribution. North and South America. Breeds along most of the Arctic coast and migrates more or less commonly throughout southern Canada. It is supposed that the spring migration is mostly through the interior of the continent and the autumn one is off the coast well out to sea. In the east, a continuous flight from Nova Scotia to Brazil is

PLATE XXI



A. Killdeer; scale, $\frac{1}{3}$



B. Blue Grouse (Sooty Grouse); scale, $\frac{1}{6}$
Female Male (hooting)

postulated, but certainly numbers of individuals take a far more commonplace route, and in the autumn are seen in the interior.

SUBSPECIES. The American Golden Plover is divided into two subspecies—an eastern one, *Pluvialis dominicus dominicus,* covering most of the continent and migrating to the pampas of Brazil and the Argentine; and the Pacific Golden Plover *Pluvialis dominicus fulvus,* confined to the west coast, breeding in northwestern Alaska and adjoining Asia and migrating to China, Oceania, and New Zealand. It is slightly smaller and, especially in autumn, is more heavily and generally washed with yellow and buff.

The American Golden Plover is very closely related to the European Golden Plover, a slightly smaller bird with lining of wings white. Within the memory of living sportsmen large flocks were regularly seen in the east, but now only occasional birds are met with. It is doubtful if it was ever numerous in the west, either in the interior or on the west coast. It is one of the few Shore Birds upon which an open season is permitted.

273. **Killdeer Plover.** KILLDEER. *Oxyechus vociferus.* L, 10·50. Plate XXI A. A medium-sized Shore Bird commonly frequenting the uplands. Pure white below, with two black breast-bands and a large amount of rusty yellow on rump and tail.

Distinctions. The double black belt across the breast and the large amount of rusty yellow on tail and rump are distinctive. It is the largest of the belted Plover.

Field Marks. Size, white underparts, and double black breast-belt, large amount of rufous on rump and tail, and loud strident voice represented as "*Kildee, Kildee*" often repeated.

Distribution. North and South America. Breeding commonly in Canada across the continent except on the east coast; in the west, north to Mackenzie and Yukon valleys.

A common bird over most of Canada. It nests in pastures and cultivated fields, as a rule at some distance from water. When its young are hatched it leads them to the nearest water, often the merest surface pool, where they dabble about the muddy edge until grown.

The species is well named *vociferus,* as it is amongst the noisiest of the noisy. One cannot approach its chosen haunts without it springing an immediate alarm that puts all within hearing at nervous attention. "*Kildee Kildee*", it cries stridently, and makes off in frantic alarm, only to return and tell it again and again to the intruder and the whole community. It alights and runs about the object of its alarm with an aggravatingly repeated "*Cry ba-by-cry, cry ba-by, ba-by*" rising to a shriek of excitement as it plays "broken wing" and makes patently misleading attempts to hide behind quite inadequate grass clumps. There may or may not be young or nests nearby. It may or may not have a proprietary interest in the ground invaded, but it acts the same in either case and is not content when at last it decoys or drives away its adopted enemy, but follows for long distances to prolong the agony and spoil his game whatever it may be. To the naturalist bent on studying some of the shyer denizens of the sloughs the Killdeer is an aggravation indeed, and at times considerable restraint is required to refrain from blowing the interfering busybody to bits and silencing its infernal and plaguing racket. However, at other times, its characteristic notes and the pretty way in which it alternately runs on twinkling little feet and pauses to look around like a Robin hunting angle worms on the lawn are very attractive. It is interesting, also, to see the different ways in which it deals with various enemies. When real danger threatens, such as a horse straying too close and threatening to plant its great hoof upon the nest, its behaviour is not the same as when a dog ranges near. Into the face of the former it flies with a sudden start and loud calls in a manner that makes the great creature jump backward or to one side in startled fright, which accomplished, the bird returns to her brooding without more ado. With a dog, however, such tactics are useless, and the Plover flies shrieking away from the nest on foot, wings dragging brokenly, legs trailing helplessly, and all in a flutter of terrified helplessness. The dog dashes at the apparently disabled bird which only just escapes the snap of the excited jaws. Another dash is also seemingly miraculously evaded and the bird manages to flutter a few rods away to repeat the manoeuver again and again, always leading away from the nest and each time nearly but not quite caught. When the enemy is thus by false hopes decoyed far from the nest the Killdeer gets suddenly well and strong and leaves her would-be devourer to dine elsewhere whilst she returns to her duties. It is an old, old game, yet ever new, not altogether peculiar to the Killdeer, and so nearly always successful that the species persists and thrives in spite of dog, fox, coyote, or cat.

274. **Semipalmated Plover.** AMERICAN RINGED OR RING-NECKED PLOVER. *Charadrius semipalmatus.* L, 6·75. A very small Plover almost as small as a "Peep," of general resemblance to the Killdeer (*See* Plate XXI A), but with one instead of two black breast-bands (Figure 179) and without the ochraceous rump and tail. Autumn birds are similar but the colours are washed out and faded, especially the blacks about head. Legs and base of bill warm yellow. Tip of bill black.

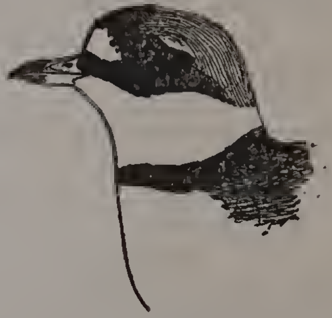


Figure 179
Semipalmated Plover; scale, ½.

Distinctions. The smaller size would prevent any confusion with the Killdeer even if the single instead of double breast-band and the dark rump and tail were not determinative. On the prairies most likely to be confused with the Piping Plover which resembles it in both colour and size. Considerably darker than that species, the back being the colour of wet, instead of dry, sand. Adult with black bar from base of bill to cheeks (compare Figure 179 with 180). Juvenile with cheeks brown instead of faintly greyish as in the case of the Piping Plover.

Field Marks. Often accompanying Least and Semipalmated Sandpipers and resembling them in size, but distinguished from them by the decided breast-band. The dark coloration, especially of the cheeks, of the adult, will separate from the Piping.

Distribution. North and South America. Breeds in the Arctics, across the continent south to southern Mackenzie, the Yukon, and Queen Charlotte islands. Migrates throughout southern Canada.

A pretty little Plover frequenting both mud-flats and sandy beaches. In the autumn, the early migrating adults with their sharply-defined markings are distinctly noticeable in contrast with the duller more blended juveniles that come later. Closely related to the Ring Plover of Europe, from which it may be separated only by smaller size and a few minor details.

277. **Piping Plover.** *Charadrius meloda.* L, 7·10. Very much like the Semipalmated Plover in pattern and size, but much lighter and with no black bar through face. Legs and base of bill orange yellow. Tip of bill black. (Figure 180, compare with 179.)

Distinctions. To be commonly mistaken only for the Semipalmated Plover, but much less common and less generally distributed. Above—even, light, ashy grey, the colour of dry, instead of wet, sand. Adult: no black bar through face and the juvenile with faintly greyish cheeks instead of brown. The breast-band may be broken in the middle or, in juvenility, very poorly defined.

Field Marks. A small peep-like Wader, with very short bill and a more or less well-defined breast-band. Very much paler than the Semipalmated, especially about the face. Its melodious little whistle has suggested the specific name *meloda.* This is the only small Ringed Plover breeding on the prairies.

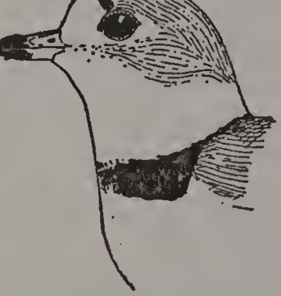


Figure 180
Piping Plover; scale, ½.

Distribution. Eastern North America, west across the prairies but scarce west of Manitoba and not recorded from British Columbia. Breeds wherever found in Canada.

A small, delightful Shore Bird, tuneful as well as beautiful. It is decidedly a sand-beach bird and is never seen in grassy or marshy situations.

Snowy Plover. *Charadrius nivosa.* It is similar in size and general coloration to the Piping Plover. It has a slight black bar, back from the eye, but no breast-band, just a single black spot on either side of the shoulders where such a band would begin. The bill, which is longer, is all black.

Has been taken in the state of Washington and may occur at any time in parts of British Columbia.

281. **Mountain Plover.** *Podasocys montanus.* L, 7·25. Smaller than the Killdeer, but much larger than either of the little Ring Plovers, which it resembles in coloration.

Distinctions. Has a dark forehead bar like the Piping Plover, no breast-band at all, and a black bar from the base of bill to eye.

Field Marks. Too rare in Canada for its record here to be accepted on field evidence.

Distribution. Western United States. Breeding on western plains, northward to nearly Canadian border. Included in this volume because of specimens taken in 1874 on the International Boundary survey near Frenchman river, Saskatchewan.

A bird of the dry uplands, almost independent of water. Occasional birds may possibly be noted in southern Saskatchewan and Alberta, as it was originally not uncommon in central Montana and still occurs there.

FAMILY—APHRIZIDAE. SURF-BIRDS AND TURNSTONES

A small family composed of two single-genera subfamilies of not very close relationship, *Aphrizinae* the Surf-birds, and *Arenarinae* the Turnstones. They have no plainly defined common characteristics suitable for exposition here, and are probably lumped together for the sake of convenience.

Subfamily—Aphrizinae. The Surf-birds

The Surf-birds are described by Dr. Coues as being Plover masquerading under the guise of Sandpipers. As there is but one species, a general description will be given under it.

282. **Surf-bird.** *Aphriza virgata.* L, 9·50. A rather large Shore Bird. Bill, plover-like with enlarged horny tip longer and more slender than usual with that family; short legs and fleshy feet with small but well-developed hind toe (Figure 181). Adult: in spring, greyish-brown above with some creamy feather edges and an irregular admixture of chestnut, working into stripes at the neck and crown and over the face and foreneck. Below, on flanks and breast, white heavily spotted and V-marked with greyish brown. Spots more or less veiled and coalesced on breast. Base of tail and rump white, remainder of tail dark. The juvenile is coloured very much like a juvenile Knot; greyish slate above, white below with foreneck and breast heavily streaked. Rump white.

Distinctions. Spring plumage more like the spring Wandering Tattler than anything else, but the grey is browner and distinctly marked on back and breast instead of plain; below, decidedly spotted instead of barred. Juvenile in general colour is halfway between the autumn Knot and the Wandering Tattler. Back, evenly grey, tending towards the ashy of the Knot and with similar fine, white, semicircular feather edge markings. The breast is more heavily striped and spotted than in either, and the white rump is distinctive.

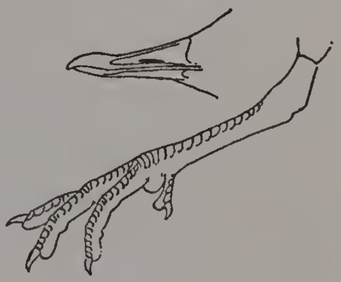


Figure 181
Bill and foot of Surf-bird; scale, ½.

Field Marks. A medium-sized Wader with bill as short as the head, considerable white on inner secondaries and white rump. In spring, breast and underparts coarsely and heavily spotted. In autumn, a grey and white Wader with decidedly but softly streaked breast and foreneck.

Distribution. Pacific coast of North and South America. Breeds in the interior of west Alaska and Yukon. Nest only lately discovered. Winters on the outer coast of Vancouver island and the coast of southern South America.

As its name implies, it is a bird of the surf. It is found on the shores of rocky islets that receive the full heave of the open sea, amidst the spume and spray of the breakers.

Subfamily—Arenariinae. Turnstones

Medium-sized Shore Birds, coloured in striking and pronounced pattern. Bill moderately short, slightly turned up and horny for terminal half. The tip is slightly flattened in horizontal plane, but not distinctly enlarged as in the Plovers (Figures 182, 183, compare with 178-180).

283A. **Turnstone** (Including **European** and **Ruddy Turnstones**). CALICO PLOVER *Arenaria interpres.* L, 9·50.

Distinctions. A strikingly coloured bird. Back in rather broad masses of dull red, black, and white more or less intermixed. Rump and head white, the crown striped with brown or black. Underparts pure white, with black breast-band, extending up side of neck to face where it makes a circle through the eye and around a white loral spot (Figure 182). Autumn birds have the colours subdued and the back coloration lost or only faintly represented, but enough of the face and breast markings always remain to suggest the above diagnosis.

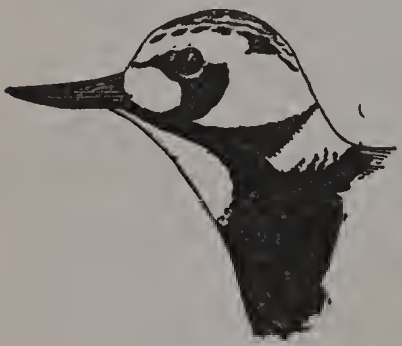


Figure 182
Turnstone; scale, ½.

Field Marks. The peculiar pied coloration in red, black, and white of the spring plumage. In the autumn the white lower back and uppertail coverts separated by a dark bar.

Nesting. Depression in the ground lined with a few dead leaves or vegetable fibres.

Distribution. The Turnstone as a species has one of the widest distributions of any bird, there being few countries where it has not occurred. The American subspecies, the Ruddy Turnstone, breeds from the Arctic coast west of Hudson bay northward, and is more common on the Atlantic than the Pacific coast. Migrates throughout most of southern Canada except the interior of British Columbia. Rather scarcer in Saskatchewan and Alberta than in Manitoba and on the coasts.

SUBSPECIES. The Turnstone is represented in America by the Ruddy Turnstone *Arenaria intrepres morinella,* rather smaller than the European form, *Arenaria interpres interpres,* more red above and legs less intensely vermilion. The latter subspecies may occur on the British Columbia coast.

A bird of sandy, muddy, or rocky shores, but preferring the sand. It is named from its habit of turning over small stones and pebbles on the beach in its search for food, and it is astonishing what comparatively large stones it can move. It inserts its bill under the edge, gives a little fillip, and away goes the stone rolling or skidding over the beach to a considerable distance.

284. **Black Turnstone.** *Arenaria melanocephala.* L, 9·50. A black and white Turnstone, more black than white. All above, except lower back and base of tail, solid black with green iridescence. Head, throat, foreneck, and breast the same, cutting sharply against pure white flanks and underparts. Narrow bar of black between white base of tail and lower back. Considerable white tipping on ends of upperwing coverts and inner

secondaries. In highest plumage, fine, sparse, white streakings on face, down sides of neck and across breast, aggregating into a vague forehead bar, superciliary line, and loral spot (Figure 183). These white specklings absent in many cases. In autumn and winter the black duller and juveniles with faint white edgings on back feathers.

Distinctions. A black and white Wader in uniform over-all masses; can be mistaken for no other species.

Field Marks. A black and white Wader coloured in broad masses. Has same white rump and lower back and uppertail coverts separated by black band as has the Ruddy Turnstone. Shows considerable white in wings in flight.

Distribution. Pacific coast of North America. Breeds in northwest Alaska and migrates down the coast, wintering from British Columbia to lower California. Never met with inland.

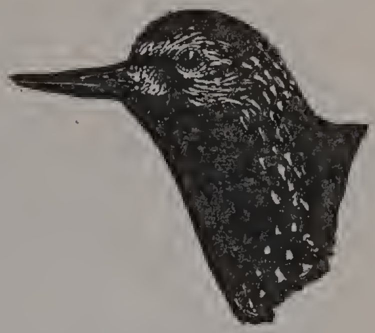


Figure 183
Black Turnstone; scale, ½.

The Black Turnstone occurs in great flocks along our west coast from late summer until the following spring. It is the commonest and most generally distributed Wader of the coast. It frequents stony and rocky shores rather than sand or mud.

FAMILY—HAEMATOPODIDAE. OYSTER-CATCHERS

General Description. Large Shore Birds more heavily built than is usual in the order; bill stout and horny, extraordinarily flattened laterally (sideways) at tip. There is only one species that occurs in western Canada and it is confined to the coast.

287. **Black Oyster-catcher.** *Haematopus bachmani.* L, about 17. A large all-black bird with long, extraordinarily flattened red bill and pink legs.

Distinctions. Not to be mistaken for any other species.

Field Marks. Large, black bird, nearly as large as a Crow, with conspicuous long, red bill (Figure 184).

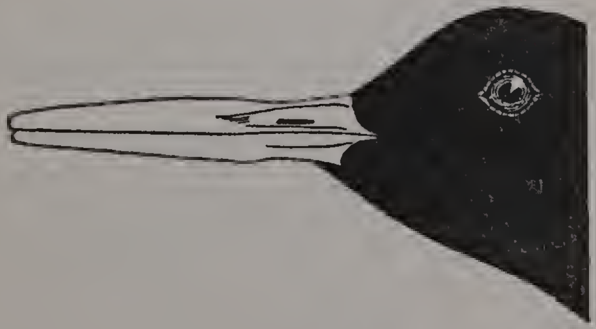


Figure 184
Oyster-catcher; scale, about ½.

Distribution. Pacific coast of North America, from Aleutian islands to Lower California, breeds throughout most of its range. Winters from British Columbia southward.

This big, showy bird is found along most of our coast and prefers rocky shores and the boiling surf to mud or sandy flats.

Order—Gallinae. Gallinaceous Birds. Scratching Birds

As the name implies, these birds are adapted for securing their food by scratching the ground. The best popular representatives are the common barnyard fowl. They are found in almost every country on the globe. In Canada we have native only one suborder of the group, *Phasiani*, the True Fowls.

SUBORDER—PHASIANI. TRUE FOWLS. PHEASANTS, QUAILS, GROUSE, AND PTARMIGAN

General Description. This suborder is composed of birds with strong, compact feet, four toes, and blunt claws adapted for scratching the ground (Figure 28, page 27). Legs and feet heavily feathered to end of toes (Ptarmigan, Figure 193). Though best adapted for terrestrial life they perch readily in trees and often feed and roost there. Bills short, horny, and with strongly arched culmen (Figure 29, page 28); nostrils set in a soft intrusion into the base of the bill; wings short and round. These birds rarely take wing except for short flights or to avoid immediate danger.

Nesting. On the ground, eggs laid on the dead grass or leaves with little or no preparation.

Distribution. Species of this suborder are found in all parts of Canada. The Ruffed and Spruce Grouse and the Turkey are birds of the woodlands; the Bob-white, Prairie Chicken, and Sharp-tailed Grouse inhabit open or prairie country; and the Ptarmigan, the barren lands of the extreme north.

Three families of this order are native to Canada. *Odontophoridae* the American Quail, *Tetraonidae* the Grouse, and *Meleagridae* the Turkeys. The Pheasants have been introduced in various places in the Dominion and have done well in British Columbia.

Economic Status. Their food is both insect and vegetable—grains, buds, leaves, fruit, and insects being equally acceptable to them. As several species frequent cultivated fields their economic status is of interest to the husbandman and has been the subject of considerable investigation, the results of which show that some of them are among the most useful birds on the farm. The insect part of the food of some species is decidedly important and very little objection can be made to the other items, which are mostly waste or wild material of little or no consequence to the agriculturist.

Like most of our larger birds they have been greatly reduced in number, and should be strictly protected and the killing of them limited to the natural annual surplus, leaving an ample permanent breeding stock untouched.

Most, if not all, members of the order in this country are subject to great fluctuation in number, and a gradual increase over a period of years followed by a sudden decrease is to be expected. The causes of this are various and complicated. A winter of unusually heavy snowfall that covers the food and fills the shelter coulées full of drifts will destroy much potential breeding stock. When a thaw or sleety weather is followed by a cold snap, it puts an impenetrable crust on the snow and prevents the getting of food or the burrowing for shelter. A long, cold, wet spring is disastrous to young birds, which are particularly susceptible to such conditions.

The welfare of these birds is linked somewhat closely with that of the rabbits and hare, not only of their own locality, but of the far north. The rabbit is the mainstay of all the carnivora—weasel, fox, coyote, lynx, Goshawk, and Great Horned and Snowy Owls. They eat other animals on occasion and even commonly, but rabbits are their staple food supply. When rabbits are plentiful, all the wilderness life waxes fat and numerous; the small mice, moles, and birds that find their enemies engaged in more profitable hunting; the fur bearers that revel in an abundance of easily caught food, and the trappers, even the great fur companies themselves, reap a rich harvest. When rabbits diminish in numbers, as they do periodically, owing to a little understood reccurrent epidemic, starvation faces the greatly augmented forces of the rabbit-eaters that but lately found life so comfortable and increase so easy. The numbers must be adjusted to a reduced food supply and thousands die by starvation and attendant evils, but not until every possible source of food supply is exhausted. Fat hunters grow lean and turn their attention to game and to hunting methods that in times of plenty are regarded with indifference, and everything of food value suffers accordingly. Competition becomes keen; raptores hunt farther afield, trespassing upon their neighbours' preserves, and the stress is intensified. Many wander far in their hungry search and invade localities where they do not normally appear. The keenest pinch naturally occurs in winter and then the resident Grouse and upland game birds suffer severely. On our prairies may be an influx of coyotes, Goshawks, and large Owls from the north, which, with the usual resident vermin, turn to the Prairie Chicken, Sharp-tailed, and other Grouse as the most available food supply, and hunt them with systematic persistence. The Grouse naturally suffer proportionately, and by the time their enemies are reduced to normal numbers, may be sadly depleted. When the tide turns, however, it does so decisively. Rabbits are astonishingly prolific and increase faster than all their enemies combined. The enemies, now tremendously reduced in numbers, again turn their attention to their natural furry prey; the food supply exceeding the demand, the wandering raptores return to their former ranges. The resident vermin have been reduced by the bitter competition with the visitors and the Grouse are again free from intensive persecution. Life becomes comparatively easy and undisturbed for them. Only the strongest and most vigorous have survived, large clutches of eggs are laid, and unless other deterrent circumstances arise they soon regain their wonted numbers.

Besides these climatic and raptorial influences, probably, as is the case with the rabbits, epidemic disease and parasites play no small part in the vicissitudes of the Grouse and their allies. These birds are to a large extent gregarious, and disease can be readily communicated. Some seasons we find many birds infested with parasitic worms, and showing other evidences of diseases that doubtless have much to do with their sudden reduction in number. How many of these diseases have been introduced with our domestic poultry it is difficult to say, but such an origin is probable.

Shooting should not be overlooked as a cause of great reduction, but the fact that in notoriously poor Grouse years the birds are as scarce in un-shot as in well-shot covers, indicates that it is not always a primary, though it may often be a contributing, cause. No species, however numerous, can successfully withstand persistent, unregulated, or excessive shooting, but just what constitutes excessive shooting varies with the locality, the season, and passing conditions. Shooting that but keeps a numerous thrifty species in reasonable control will annihilate it when already depleted by other causes. Consequently laws for the protection of Grouse have to be continually altered and adjusted to conditions, but even in spite of the best of laws thoroughly enforced in both letter and spirit, upland game must be expected to fluctuate in numbers and years of plenty be followed by scarcity, at which times every endeavour must be made to assist recuperation.

FAMILY—ODONTOPHORIDAE. AMERICAN QUAILS

General Description. The smaller representatives of the suborder in Canada. The nostril is partly covered with a fleshy scale and not so well hidden in the feathering in this family as in the Grouse. There is only one species native to Canada, the Bob-white *Colinus virginianus*, of southern Ontario. In the west, several species have been introduced and are doing well, the Common Grey or Hungarian Partridge from Europe, *Perdix perdix*, on the prairie land, the Mountain Quail *Oreortyx picta*, and California Quail *Lophortyx californica*, from the western United States in British Columbia.

The term "Quail" for our American birds is a misnomer. They are not Quail in the European sense, but true Partridges. Moreover, our so-called "Partridges" are Grouse. These are examples of a common misapplication of Old World names to New World forms. There are many such cases, confusing to the beginner but too well established in vernacular usage to be corrected at this late date.

The family is of rather southern distribution, reaching its maximum in number of both species and individuals in the southwestern United States and Mexico.

Mr. Ogilvie-Grant in Catalogue of Birds in British Museum XXII, includes the Common (Hungarian) Partridge, the American Quail, and the Pheasants in the family *Phasianidae* based on naked (not covered by feathers) nostrils, bare tarsi, often with spurs, and unpectinated toes, without comb-like processes at sides. As the American Ornithologists' Union has not provided for such introduced species in its Check-list this family is not recognized by it. Undoubtedly in the spirit of that Check-list the Common Partridge and the Pheasants would be given a separate family from that of the so-called American Quail.

289. **Bob-white.** QUAIL. AMERICAN QUAIL. *Colinus virginianus.* L, 10. A very small partridge or quail-like bird. Above—coloured in warm shades of pinkish or vinaceous brown, with dark brown mottlings, and a few lines of ochre or cream. Below—mostly white, decidedly barred with sharp black vermiculations. Flanks streaked with a pinkish brown which is also suffused evenly over the breast. A black gorget across upper throat, extending to cheeks and face, invades the reddish brown crown. A sharply-defined white throat, and white superciliary line extends down neck and breaks into fine white spots along sides of lower neck. The female is similar, but with duller, more blended colours, no black on face and neck, and an ochre instead of white throat and superciliary line.

Distinctions. The only pinkish-coloured partridge or quail-like bird of its size likely to occur in the area covered by this work.

Field Marks. Quail-like appearance, very small size, and ruddy coloration. Its clear, whistled call of "Bob-white" is unmistakable.

Distribution. Eastern North America, from just north of the Canadian boundary along lake Erie to Texas and Mexico. It has been introduced in southern Vancouver island, Fraser valley, and Ashcroft and Vernon districts, British Columbia. For a time it throve in the last two localities, but later was almost killed off by severe winters, but a few may still be found in the districts mentioned. It is not as hardy as the California Quail. A further attempt at introduction was made near Victoria in 1922, but with what success is not yet known.

SUBSPECIES. There are several subspecies of the Bob-white recognized, but as the source of the introduced birds is unknown and no specimens are available for examination, we are unable to say to what race they belong.

Dr. Coues in his "Key to North American Birds" separates the Old World Partridge and Quail, including the next species, from the American ones under a separate subfamily *Perdicinae*, and reduces the American Ornithologists' Union family *Odontophorinae* to co-ordinate rank.

Introduced:

European Grey Partridge. COMMON PARTRIDGE. HUNGARIAN PARTRIDGE. *Perdix perdix.* L, 12·6. Considerably smaller than our commoner Grouse but considerably larger than any of our so-called Quail. A very fine vermiculated intermixture of black, white, rusty, and cream on back, neck, and breast; more rufous on lower back and nearly clear black and white with a general greyish effect on breast. Wing-coverts sharply shaft-streaked with cream. Flanks barred with white and chestnut. Face, throat, and superciliary line of tawny chestnut (Figure 185). A conspicuous double spot or horseshoe mark of rich chestnut occupies the upper abdomen. Sexes similar in coloration but female in duller tones.

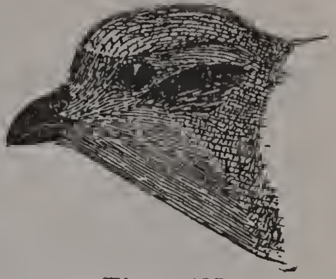


Figure 185
Hungarian Partridge;
scale, ½.

Distinction. The only partridge-like bird with such fine vermiculation, reddish throat, and chestnut abdominal patch.

Field Marks. In localities to which it is likely to extend it cannot be mistaken for any other bird, the Ptarmigan being the only grouse-like bird of similar size or fine vermiculations. In flight it is dull, obscurely coloured, and shows a large amount of rufous brown in tail.

Distribution. Europe and west-central Asia. Introduced in Alberta near Calgary about 1908 and now, 1923, has extended its range north nearly to Edmonton, south to the International Boundary, and east to the central parts of Saskatchewan. Within this area it thrives and good bags are being made in season.

It was also introduced on southern Vancouver island and the adjoining mainland about 1905. Here, it met with varying fortune, but on the whole has become well established and is now present in fair numbers. It has also spread north from the state of Washington into the Okanagan district where it is increasing and spreading rapidly.

The objection to the importation of foreign species does not apply as strongly to game birds as to others. Species that are systematically hunted for economic use are in very little danger of becoming too plentiful; the problem in such cases is one of conservation rather than of control as, should it be necessary, there are plenty of sportsmen ready to reduce their number without bounty, bonus, or other artificial incentive. If the shooters were to pursue the House Sparrow, Crow, or other vermin as assiduously as they do game birds, the problem of their control would soon be solved. Even so, there is one thing to be borne in mind—that we cannot have foreign species except at the expense of competing native ones. It is notable that wherever this or other introduced species have increased to any marked extent, the resident Grouse and Prairie Chicken have decreased in a similar degree. Sportsmen and the game departments of the various provinces should face this fact squarely and decide whether they prefer foreign to native game; they cannot well have both in the same area.

Introduced:

292. **Mountain Quail** (Including **Plumed Quail**). *Oreortyx picta.* L, 11·50 Pale, olive-grey on back, lightening to clear, light, slate-grey on head, neck, and breast· Flanks conspicuously barred with dark brown alternating with white, between two bands of rich chestnut. The throat has a sharply defined chestnut patch, black edged, and bordered by a white crescent. The most striking ornament, however, is a long, black, pencil-like plume springing from the crown and falling over the back (Figure 186). The sexes are almost alike.

Distinctions. Rich chestnut throat, flank bars, and the long pencil plume.

Field Marks. Size, long, slender black plume, and chestnut on flanks.

Distribution. Originally the Pacific coast from Washington south into California. Probably the first attempt at introduction into Canada was made on Vancouver island about 1865 with birds from San Juan island, where the species was indigenous, but it was not successful. About 1872 another attempt was made with birds from the same locality and the species is, in consequence, today fairly common locally in Victoria and Sooke regions, Vancouver island, and has been noted as far north on the island as Duncan.

SUBSPECIES. Several subspecies of Mountain Quail are recognized. The subspecies native to the lower levels west of the Cascades where our stock originated in Washington is the type form *Oreortyx picta picta*, and our birds are probably the same, though in the various introductions that have been made in Washington, a strain of the plumed Quail *Oreortyx picta plumifera* from the higher levels adjacent may have been intermixed.

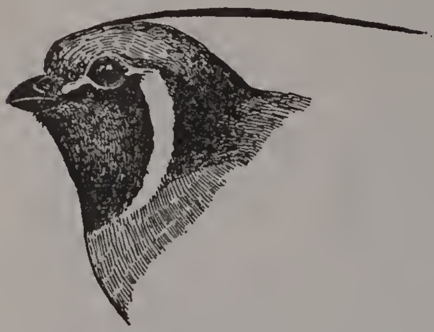


Figure 186
Mountain Quail; scale, ½.

294. **California Quail** (Including **Valley Quail**). *Lophortyx californica.* L, 10·50. Above—olive-grey blending into olive-brown on wings and flanks, greying on tail and neck; breast clear blue-grey. Abdomen—peculiarly scale-marked with sharply defined black borders on white, ochre, and light chestnut ground. Flanks sharply streaked with white. Jet black throat patch with white border and white superciliary line. Forehead, light ochre. A cape of beautifully white-speckled, black-margined grey feathers falling from crown to shoulders. The most distinctive feature, however, is a plume of several scimitar-shaped, black feathers an inch or more in height, springing from the crown with the tips pointed forward (Figure 187). Female similar, but plumes much smaller and colours reduced and blended.

Distinctions. With scimitar-shaped plumes, white-bordered black throat, and scaled abdomen unmistakable for any other bird in Canada.

Distribution. Originally, Pacific coast from Oregon to southern Lower California. Introduced into British Columbia.

Probably introduced into the state of Washington near Seattle about 1874, and on Vancouver island shortly after. Here, they appear to follow the broom-plant which affords them shelter from vermin and weather as well as food. They suffer under occasional heavy snowfalls in winter, but soon recuperate. The centre of abundance is still southern Vancouver island, but they occur at least as far north as Comox. Attempts to introduce them in the Fraser valley have not been successful, but about 1900 they were introduced in the southern Okanagan valley where they have done remarkably well.

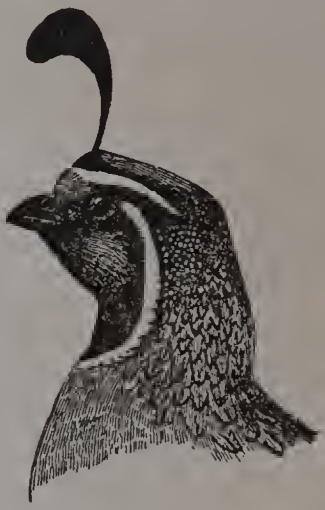


Figure 187
California Quail; scale, ½.

SUBSPECIES. The typical form, the Valley Quail *Lophortyx californica californica*, seems to be the race to which our birds should be referred. It is unfortunate that importers are careless as to the origin of their introductions. Where restocking of covers has been numerous, the stock has in many cases become hopelessly mongrelized. Restocking should be in the hands of responsible authorities, careful records kept, and the purity of the strain maintained.

Introduced:

Ring-necked Pheasant (Including **English** and **Mongolian Pheasants**). CHINA PHEASANT. *Phasianus torquatus.* L, 35. A large, game-cock-like bird. Male: strikingly and magnificently coloured, with narrow, gracefully pointed tail about 15 inches long. Back, beautifully variegated in complicated pattern with deep maroon, cream, ochre, black, and shades of emerald green, many of them metallic. The back is mostly green, the wing-coverts mostly maroon, and the cape mostly ochre. Breast, solid, rich burnt sienna, with violet reflections and scale marked with black feather edges, abdomen black and rich ochre on flanks spotted with purple black. Head and neck, except crown, brilliant, steely black with conspicuous white collar about base. Face largely bare red skin, and crown metallic greenish ochre with white superciliary line. Short, steel-black ear tufts (Figure 188). The tail is largely dull olive-ochre barred with black. The female is entirely unlike the male. Variegated in dull earthy ochres and rich dark brown markings. The ochre being clear on the breast, the markings heaviest on back, growing smaller and finer towards the head. The tail is about half as long as that of the male.

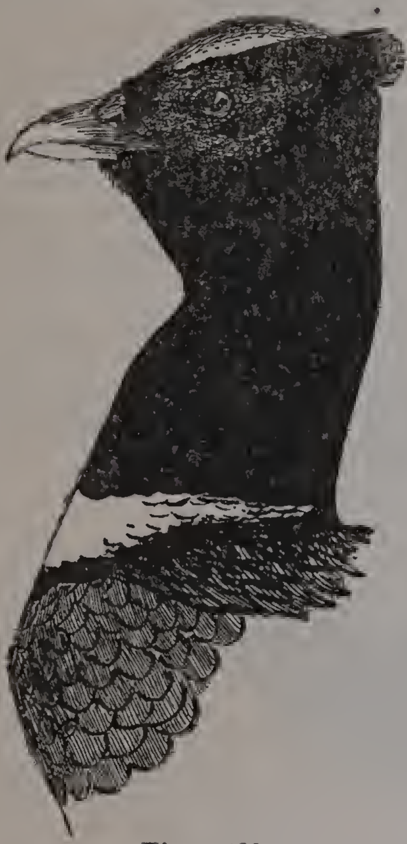


Figure 188
Ring-necked Pheasant; scale, ½.

Distinctions. No other wild bird is found in Canada with such a long tapering tail or such a wonderful mixture of showy colours. Many of these birds have crossed with the English Pheasant, an impurely bred *Phasianus colchicus.* The two are very similar in coloration, but *colchicus* is without the white ring on the neck. The mantle is fiery orange and there is less greenish ochre on the crown.

The Mongolian Pheasant *Phasianus mongolicus* was introduced into British Columbia from Shantung province, China, in 1909, and has hybridized with the above and still further obscured the specific characters of the birds of the British Columbia mainland and Vancouver island. It has a white neck-ring like *torquatus* but interrupted in front, and the lower back and rump are orange-red mixed with dark green more like *colchicus.* On the whole the Pheasants of British Columbia are so hopelessly mongrelized that it takes an expert quite familiar with the various species to estimate the mixed relationships of individuals.

Field Marks. Long sweeping tail, seen on no other bird except some other Pheasant that may have escaped from confinement.

Distribution. Eastern China, Manchuria, and Mongolia. Introduced in a number of places in Canada at various times, but only in southern British Columbia with marked success. On southern Vancouver island and on the mainland along Fraser river and the southern valleys adjoining it has become well established and is one of the regular game birds.

It makes a magnificent object of sport to the upland shooter. Being wild, wary, and well able to take care of itself, it satisfactorily tests the hardihood and skill of the hunter. When brought to bag, the cock, which alone can be legally shot in British Columbia, is a magnificent trophy and large enough to furnish an appreciable addition to the table. Some complaints have been made as to its effect on certain crops and its belligerent attitude towards native Grouse. How well-founded these complaints are, experience alone can decide. One thing is certain, that we cannot have such a fine, large bird without a complementary loss of other native, competing species. Just how far we want to go in this replacement of native by foreign forms is a question that a community cannot solve for itself without considering the welfare and wishes of its neighbours, as species once successfully established spread indefinitely and refuse to be confined by county, provincial, state, or national boundaries.

FAMILY—TETRAONIDAE. GROUSE

The Grouse have the nostrils hidden in feathers that occupy an intrusive space in the base of the bill at the sides (Figure 29, page 28). The tarsus is either completely or partly feathered; in the Ptarmigan the feathering includes the toes. The toes when unfeathered are bordered on each side by a small fringe composed of individually horny scales of pectinations (Figure 28, page 27), which are shed in midsummer. Many of them, especially in breeding season, have fleshy erectile combs, over the eyes, coloured yellow or red. The Grouse comprise the bulk of our upland game birds and are great favourites of sportsmen. The sexes are nearly alike, show slight seasonal variation in plumage, except in the Ptarmigan, and do not usually migrate. The Ptarmigan, which directly reverse each of these statements, are so well characterized otherwise that no confusion is probable. All species nest on the ground, making little preparation for the eggs. They lay unusually large sets of eggs, six to eighteen, and the young, chicken-like, follow the parent as soon as out of the shell.

297. **Blue Grouse** (Including **Sooty, Richardson's,** and **Fleming's Grouse**). *Dendragapus obscurus.* L, about 21. Plate XXI B. A large Grouse coloured in even masses of slate-grey running into rich dark browns and black with little white detail. Females similar but duller, more mottled with brown and white, tending towards bars and more intermixture of rusty on back and flanks.

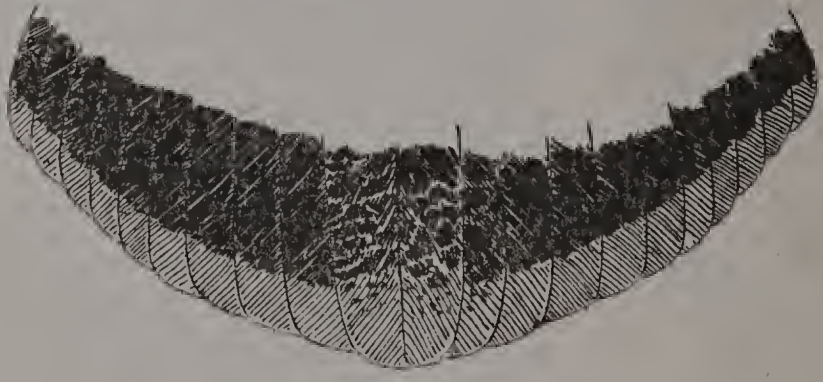


Figure 189
Tail tip of Sooty Grouse; scale, ½.

Distinctions. The large amount of uniform slate-grey, especially below, and small amount of white or other pattern elsewhere, will separate the Blue from all other Grouse. Most resembles the Spruce Partridge, or Franklin's Grouse, but with far less pattern and much larger.

Field Marks. A large Grouse, very evenly grey. In size, likely to be confused only with the Sharp-tailed or Ruffed, but entirely different from either.

Distribution. Rocky Mountain and Pacific Coast region from upper Yukon south to California. To be expected in the Prairie Provinces only in the foothills, but a few have been reported from upper Mackenzie river.

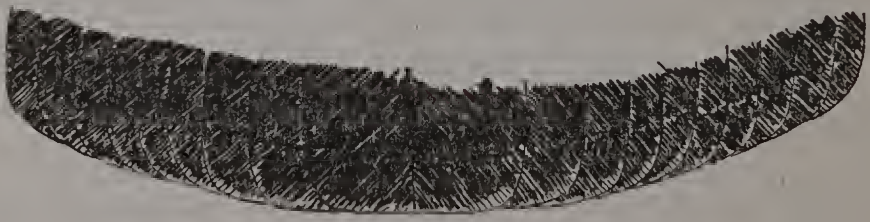
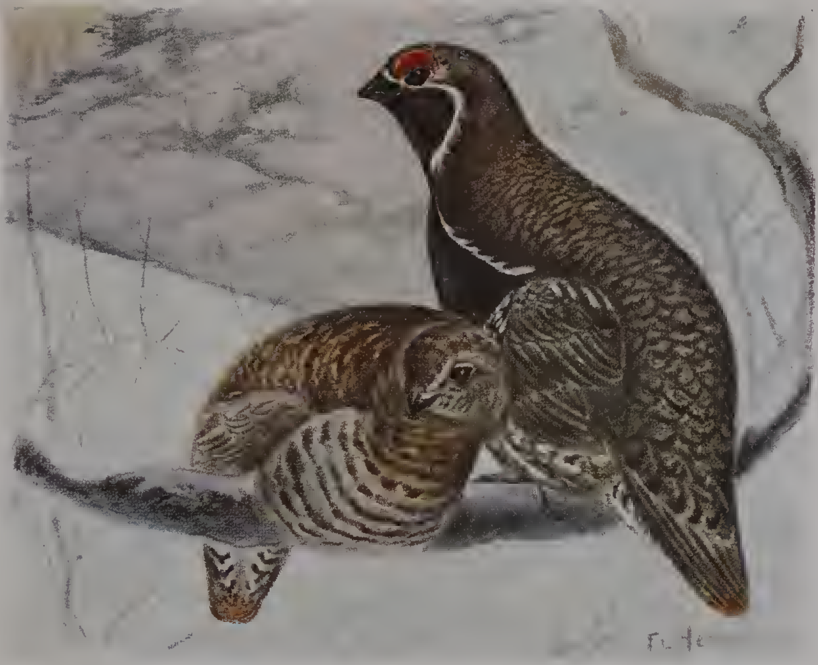
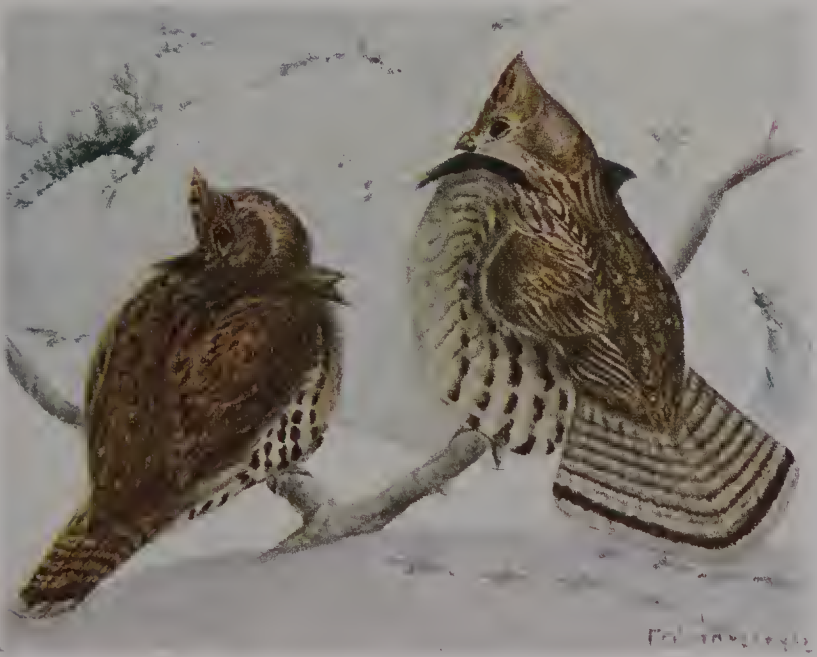


Figure 190
Tail tip of Richardson's Grouse; scale, ½.

SUBSPECIES. The Blue Grouse in Canada is divided into two well-defined, recognized subspecies that may possibly eventually be raised to full species as their difference in life, habit, vocal ability, and general action suggests a greater differentiation than do their external characters. The Sooty Grouse *Dendragopus obscurus fuliginosus* is the coast form occurring only west of the Cascade and Coast Range divide. It is distinguished by being generally darker than the interior bird, and, with the ends of the tail feathers more rounded, and with a distinct grey terminal tail band about three-quarters of an inch wide (Figure 189, compare with 190). The bird of the interior, Richardson's Grouse *Dendra-*



A. Spruce Partridge; scale, $\frac{1}{5}$
Female Male



B. Ruffed Grouse; scale, $\frac{1}{6}$
Red phase Grey phase

gopus obscurus richardsoni, ranging east to the Rocky mountains, is slightly lighter in general coloration, the tail feathers are cut more squarely across the end, and the terminal band is either absent or but faintly defined (Figure 190, compare with 189). These characters are not finally determinative and in coloration the two forms occasionally seem to merge. Though so nearly alike the two are very different in habitat and habits. Both hoot, but though the hoot of the male Sooty can be heard for miles, that of Richardson's is inaudible at a few hundred yards. Strangely, the females of both forms seem to have a single loud note of great carrying power. Adult males of the Sooty Grouse in spring have the skin on the sides of the neck bright yellow, thickened, capable of distention and display. Plate XXI B shows this form with neck sacs inflated in the act of hooting. These features are practically absent from Richardson's Grouse. Besides these two forms a dark northern interior one, *Dendragopus obscurus flemingi*, most nearly related to *richardsoni*, is recognized from northern British Columbia and southern Yukon. A reddish northern coastal one, resembling *obscurus*, has been recorded from southern Alaska and adjoining British Columbia, but has not yet been passed upon by the American Ornithologists' Union Committee. The female of this last species is sometimes so strikingly red as to have given rise to reports of the Ruffed Grouse occurring on Queen Charlotte islands.

298. **Spruce Partridge** (Including **Hudsonian, Alaska,** and **Canada Spruce Partridge**). SPRUCE GROUSE. CANADA GROUSE. FOOL HEN. *Canachites canadensis*. L, 15. Plate XXII A. A small Grouse. The male coloured in black, grey, and white with small red comb but little other colour. Female irregularly barred all around body with the same colours, but with large admixture of rusty-brown.

Distinctions. Size will distinguish from any other Grouse but the very closely allied Franklin's Grouse of British Columbia and the mountains, and the Ptarmigan of the north and higher elevations. Easily distinguished from the latter by the unfeathered toes (compare with Figure 193). The male is distinguished from Franklin's by the rusty-ochre tips to the tail feathers and the absence of broad white tips to uppertail-coverts (Figure 191, compare with 192). Northwestern birds, the Alaska Spruce Grouse, sometimes have white at the end of tail coverts, but never on the tip of tail itself which is a common character in Franklin's of either sex. Females are more difficult to distinguish and may at times be inseparable from Franklin's. The rusty tail tip and the absence of broad white tips to uppertail-coverts in this species are the best distinctions.

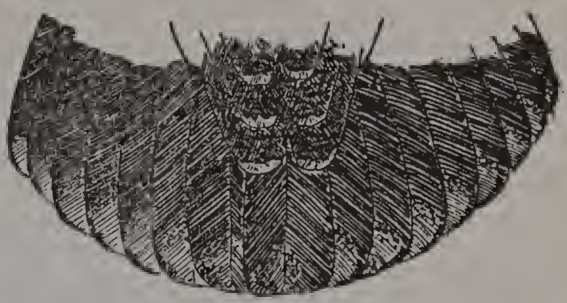


Figure 191
Tail tip of Spruce Partridge; scale, ⅓.

Field Marks. Small size and general black, grey, and white coloration and red comb of male. Female is a small, reddish-brown Grouse strongly banded all around body. Unless terminal rusty tail band is observed in flight probably not separable by sight from Franklin's Grouse.

Distribution. The northern spruce forests across the continent. In the Prairie Provinces south to the edge of the continuous forest, but not extending far southward in the mountains. In British Columbia not reaching the Canadian National Railway tracks nor the coast anywhere.

SUBSPECIES. The Spruce Partridge is divided into several recognized subspecies.

The Hudsonian Spruce Partridge *Canachites canadensis canadensis* occupies most of the northland from Labrador west to the base of the Rocky mountains near Jasper park. There is also an apparently isolated community on the southwest coast of Alaska; for which a separate name has been proposed. The Alaska Spruce Partridge *Canachites canadensis osgoodi* occupies central Alaska, the Yukon, northern British Columbia, and Mackenzie valley. Manitoba, north to the head of the big lakes, is inhabited by the Canada Spruce Partridge *Canachites canadensis canace*, which is also the southern Ontario and Maritime Province form. These races are too slightly defined, however, to warrant consideration by any but the expert with a large series of specimens for comparison.

The Spruce Partridge though colloquially and officially called "Partridge" is a true Grouse that has been misnamed through general but careless usage. It is a bird of the northern woods. Its over-confiding nature has given it the name of "Fool Hen" as, where not much disturbed, it can be killed with sticks or stones. For this reason it is one of the first birds to disappear before settlement and it is rapidly vanishing from all but the most retired and lonely localities. Owing to its feeding largely upon spruce or evergreen buds its flesh in late or middle winter is usually too strong for the ordinary civilized palate and it can not be listed as a legitimate game bird.

299. **Franklin's Grouse.** FOOL HEN. *Canachites franklini.* L, 15. Almost exactly like the Spruce Partridge (*See* Plate XXII A), but with tail black to the tip or else with narrow white termination and generally with conspicuous white tips to uppertail coverts (Figure 192, compare with 191).

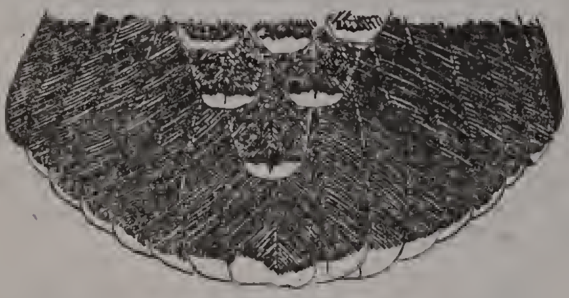


Figure 192
Tail tip of Franklin's Grouse; scale, ½.

Distinctions. Size will distinguish from anything but the very closely allied Spruce Partridge of northern British Columbia and the Prairie Provinces, and the Ptarmigan of the far north and high elevations. Easily distinguished from the latter by the unfeathered toes (compare with Figure 193). The male is distinguished from the Spruce Partridge by the lack of rusty-ochre tips to the tail feathers, its replacement by a narrow line of white or, usually, pronounced white tips on the uppertail-coverts. This last character sometimes occurs in the Alaska form of the Spruce Partridge which, however, never has the white tail tip common to both sexes of Franklin's. Females are more difficult to distinguish and may at times be inseparable from the Spruce Grouse. The lack of rusty in tail tip and the presence of broad white tips to uppertail-coverts are the best distinctions. Specimens approaching intermediate may occur. Slight traces of rusty on tail tip may occur in Franklin's Grouse, but never anything like a terminal bar. This difference never seems quite bridged over and is, therefore, regarded as fully specific.

Field Marks. Small size and general black, grey, and white coloration and red comb of male. Female a small reddish-brown Grouse strongly banded all around body. Probably inseparable in life from the Spruce Grouse unless the terminal tail characters are evident. There are, however, but few places where their ranges overlap.

Distribution. The mountains of northern Oregon to central British Columbia from the Coast range to the eastern slopes of the Rockies in Alberta.

All said of the Spruce Grouse is equally true of this species.

300. **Ruffed Grouse** (Including **Canada, Grey, Oregon,** and **Yukon Ruffed Grouse).** PARTRIDGE. BIRCH PARTRIDGE. *Bonasa umbellus.* L, 17. Plate XXII B. A large woodland Grouse coloured in wood-browns and greys. Broad, soft, black feathers making "ruff" on sides of neck, and lower back feathers with small, fine eye-spots. Female similar but with ruffs smaller. Occurs in two phases, regardless of age, sex, or season. A red form with the light parts of the tail brick red, the browns elsewhere tending towards reddish rather than grey, and with copper-coloured (or black) ruffs. In the grey phase, the ground colour tail is ashy-grey, there is much grey overwash on the back and elsewhere, and the ruffs are steely black. There are various intergrading and mixed plumages.

Distinctions. The soft, black ruff feathers on the sides of the neck, the broad, ample, many-barred tail, and the small eye-spots on lower back make this an easily distinguished species. The legs are more sparsely feathered than in other Grouse and the lower half of the tarsus is bare (Figure 28, page 27).

Field Marks. Size, general coloration, ruffs, and especially the broad grey or red, many-barred tail which is very conspicuous when the bird is flushed.

Distribution. Wooded regions of Canada and the northern United States. In Canada absent only in a few localities of the most southern arid prairies.

SUBSPECIES. The Ruffed Grouse is split into a number of recognized subspecies. The Canada Ruffed Grouse *Bonasa umbellus togata* is the east Canadian form and extends across the continent into southern British Columbia and to the east slope of the Coast range. This is the bird described above. The Grey Ruffed Grouse *Bonasa umbellus umbelloides* occupies the interior of British Columbia. It has considerably more grey veiling on back and elsewhere and the red phase is scarcer. The Yukon Ruffed Grouse *Bonasa umbellus yukonensis* is a newly recognized form of Alaska and Yukon. It carries the general greyness still farther than in the previous forms. The Oregon Ruffed Grouse *Bonasa umbellus sabini* is the bird of the Pacific coast, west of the Coast range. This is a very red bird with little or no grey anywhere. The back is in general a warm rufous-brown and the breast and underparts are heavily and broadly barred. The extreme grey phase is scarcely greyer than some of the red birds of other subspecies.

Owing to the dichromatism and great individual variation in this species these races, except *sabini*, are difficult to separate and considerable confusion prevails amongst authorities as to their relative distribution. Typical birds of the *umbelloides* type can be found intermixed with good *togata* far east on the prairies and south near the boundary of British Columbia, and *vice versa, togata* specimens crop up in *umbelloides* regions. Probably only in the extreme ranges will the forms be found pure and unmistakable, and most local races can only be determined by average characters that leave room for wide variation in personal opinion. With such wide areas of overlapping it is hardly safe to be dogmatic. The above ranges give the present opinion of the writer based upon quite considerable material, but this does not agree with the American Ornithologists' Union Check-list which extends *togata* west only to Manitoba and extends *umbelloides* over the prairies and southern British Columbia, referring the Alaska and Yukon birds to *yukonensis*.

The Ruffed Grouse is the "Partridge" of most Canadian sportsmen. Where it has learned its lesson of wariness, as in old centres of settlement, it offers probably the best sport of any of our upland birds. Lying close in the dense underbrush and bursting from the tangle like a miniature explosion, attaining full speed almost instantly, and hurtling away in the shadowy aisles of the bush, it tests the alertness and the skill of the finest marksman. However, all birds have not learned the lessons so necessary to existence and shooting Ruffed Grouse in the west is a severe test of sportsmanlike ideals. Too often it degenerates into pot-hunting and shooting on the ground or from trees. Such methods may fill the bag but are no more sportsmanlike than killing poultry with an ax.

The Ruffed Grouse is a bird of the bush and is seldom seen away from timber. Through the prairies it is to be found in most of the larger poplar bluffs and in the wooded valleys of the rivers. Its drumming is a sound well known to all frequenters of the woods. It is a series of reverberating throbs made by rapidly beating wings and has a peculiar all-pervading intensity that makes the direction of its origin difficult to locate. The beats begin slowly with measured frequency, gradually increasing in speed until at the end of perhaps five seconds they run into each other and die away in a confused whir. The male is usually strutting on a favourite fallen log when he pauses to drum. During the drumming the bird displays all his ornaments—tail, crest, and ruff—and his wings are lost to sight in a haze of speed. Two explanations of the sound are advanced, one that the wings are struck together over the back and the other that they are brought against the sides to produce the beat. The sound of the bird as it suddenly rises to wing, rapidly beating the air, has a quality similar to that of the drumming and it would seem that the beating of the air is sufficient to produce the effect. The action is, of course, the call of the male to the females as is the display of the Peacock or the Turkey gobbler. Spring is the proper season for drumming, although it is indulged in regularly in the autumn also, probably in sheer exuberance of spirits, for there is no sexual activity accompanying it and the females appear to give it no particular attention.

PTARMIGAN

General Description. Ptarmigan are Arctic Grouse and notable for their remarkable seasonal change in plumage. In winter they are, except for certain details in some species, pure white; in summer, they are barred or vermiculated with various shades of red, brown, and ochre, with irregular white feathers and patches remaining from the winter. The moult seems practically constant throughout the summer, and as they have an autumn as well as a summer plumage, some very puzzling plumage mixtures occur. In the same bird white feathers of the previous winter may still persist when similar ones of the coming winter season are appearing together with a mixture of both the summer and the autumn plumages. The principle characteristic of the summer plumage is generally a distinct and coarse cross-barring and that of the autumn is fine vermiculation and an intimate pepper and salt mixture of colours. There is evidence as well, in at least one species, the Rock Ptarmigan, of two colour phases similar in character to those of the Ruffed Grouse. In summer, irregular patches of white may persist and the wings are always white. The feet are feathered to the toes (Figure 193). With these decided characteristics there need be no mistaking this group. In midsummer the toes in moult may seem bare, but the worn feathers remaining and the incoming pin feathers always show that this is but an intermediate condition. Under certain conditions the nails seem to overgrow in a remarkable manner.

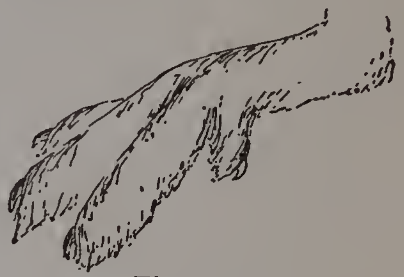


Figure 193
Feathered foot of Ptarmigan; scale, about ½.

Ptarmigan are circumpolar and like many other Arctic forms they extend southward along the mountain tops where high elevation carries northern conditions into more southern latitudes. The northern individuals make long seasonal migrations, walking much of the way but flying occasionally, and are capable, when necessary, of making passage of quite wide stretches of water, as between the Arctic islands. Those of more southern habitat move down the mountain sides to find more southern conditions.

There are three species of Ptarmigan in America, one of which, the White-tailed, is peculiar to the Rocky Mountain region. The Red Grouse of Scotland is an interesting Ptarmigan that has lost its ability to turn white in winter.

Our three Ptarmigan have been split up into various races, but individual and seasonal variations, to say nothing of a dichromatic tendency, are so great and the racial differences are so slight that none but an expert, with large experience in the group and ample specimens, is competent to separate them.

301. **Willow Ptarmigan** (Including **Alexander's Ptarmigan**). *Lagopus lagopus.* L, 15. The largest of our Ptarmigan. In winter all white excepting for the tail which is black (Figure 194). A scarlet comb over the eye is prominent in spring and may persist more or less at other seasons.

The summer plumage is rarely complete and first appears on the head spreading to breast. In the male, the plumage is nearly uniform maroon brown to almost black on throat and breast, with barring on crown and hindneck. The autumn coloration of these parts is considerably lighter, no darker than rich chestnut, and the upper parts are markedly barred with shades of reddish ochre and dark brown, with comparatively little of the fine vermiculation that is such a striking feature of the autumn plumage of the other species.

The females are heavily barred with dark brown and ochre, the latter being predominant. They are not nearly as red in general effect as the male.

Distinctions. A small Grouse. Feet feathered to toes (Figure 193) and white wings distinguish them as Ptarmigan. The black tail always separates the Willow from the White-tailed Ptarmigan, and the larger bill from the Rock Ptarmigan. The greatest difficulty of separation will be from summer and autumn plumages of Rock Ptarmigan. The male is recognizable by colour in summer or autumn by the more general reddish effect, especially the large masses of almost even red on neck and breast; neither sex ever shows the fine pepper and salt vermiculation that is so characteristic of the autumn plumage of the other two species. Females in the summer plumage are difficult to separate by colour characters from the parallel plumage of the Rock Ptarmigan; size, especially of the bill, which is larger and less slender, makes the most reliable criterion (compare Figures 194 and 195). The bills may be variable in size, but no Rock Ptarmigan has the bill quite as heavy as the lightest of this species.

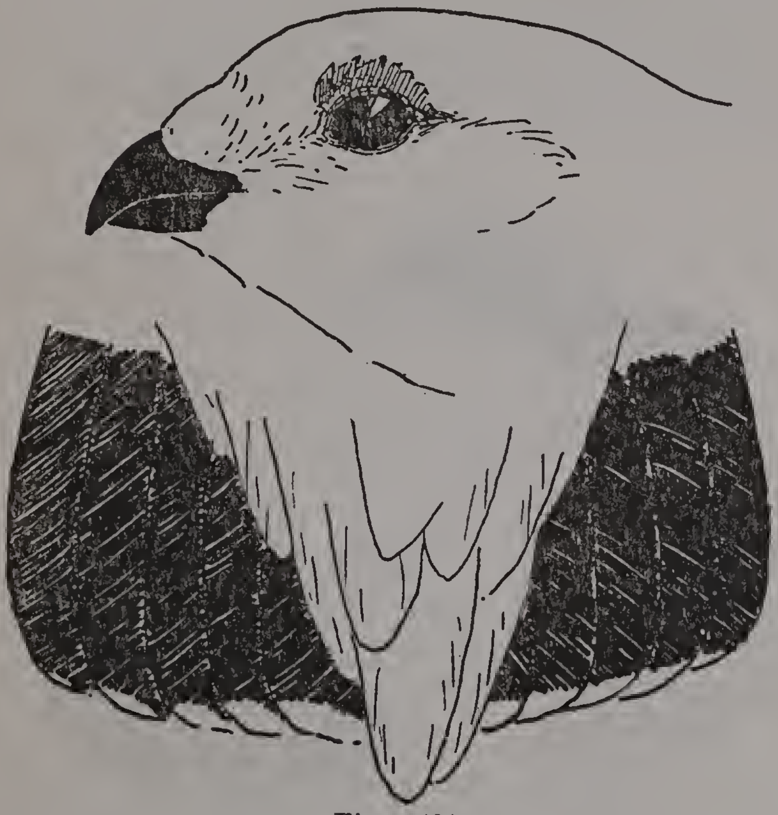


Figure 194
Specific details of Willow Ptarmigan; [natural size.

Field Marks. As Ptarmigan, in winter, by nearly complete whiteness and in summer by white patches on body plumage and white wings. From the White-tailed at any season by black tail. Probably rarely separable in life from the Rock Ptarmigan.

Distribution. Northern parts of northern hemisphere. In America across the continent mostly north of tree limits in summer, migrating occasionally to northern edge of prairies in winter. Also occurring at some elevation south to central British Columbia.

SUBSPECIES. The generally recognized race of Willow Ptarmigan throughout most of western Canada and also occurring in Europe is the type form, *Lagopus lagopus lagopus.* Alexander's Ptarmigan *Lagopus lagopus alexandrae,* a southern Alaskan coast form, has been reported from Porcher island, British Columbia, near the Alaska-British Columbia boundary.

302. **Rock Ptarmigan.** ARCTIC PTARMIGAN. *Lagopus rupestris.* L, 13. The intermediate in size of the three Ptarmigan. In winter, all white except a black tail and usually a black bar through eye to the base of bill (Figure 195). A scarlet comb over the eye is prominent in spring and may be present to a lesser degree at other seasons.

The summer male is decidedly barred with dark and ochre with little white intermixed, the dark being predominant. In autumn plumage the same colours are present but generally lighter and vermiculated with a fine pepper and salt effect, the ochre predominating and with more white than in summer which gives a greyish overcast.

Females are coarsely barred, showing much more light colours than the male. The autumn plumage has the barring reduced and is somewhat less finely vermiculated than the male. It may be double phased; one phase being predominantly ochre, the other being more greyish.

Distinctions. A small Grouse. Feet feathered to end of toes (Figure 193) and white wings distinguish it as a Ptarmigan. The black tail separates it from the White-tailed Ptarmigan, and in winter the black streak through the eye, sometimes reduced, occasionally obsolete, from the Willow. The greatest difficulty of separation will be from summer Willow Ptarmigan. The male is recognizable by colour in either summer or autumn plumage by the lack of any mass of red and the presence of pronounced crossbarring. In the autumn plumage both sexes show a pronounced, fine vermiculation foreign to the Willow. Females in summer plumage are difficult to separate from similar plumage of the Willow Ptarmigan by colour characters, and size, especially of the bill which is lighter and slenderer as well as smaller, makes the most reliable criterion (compare Figures 195 and 194). The bill may be quite variable, but no Willow Ptarmigan ever has the bill quite as slight as the heaviest of this species.

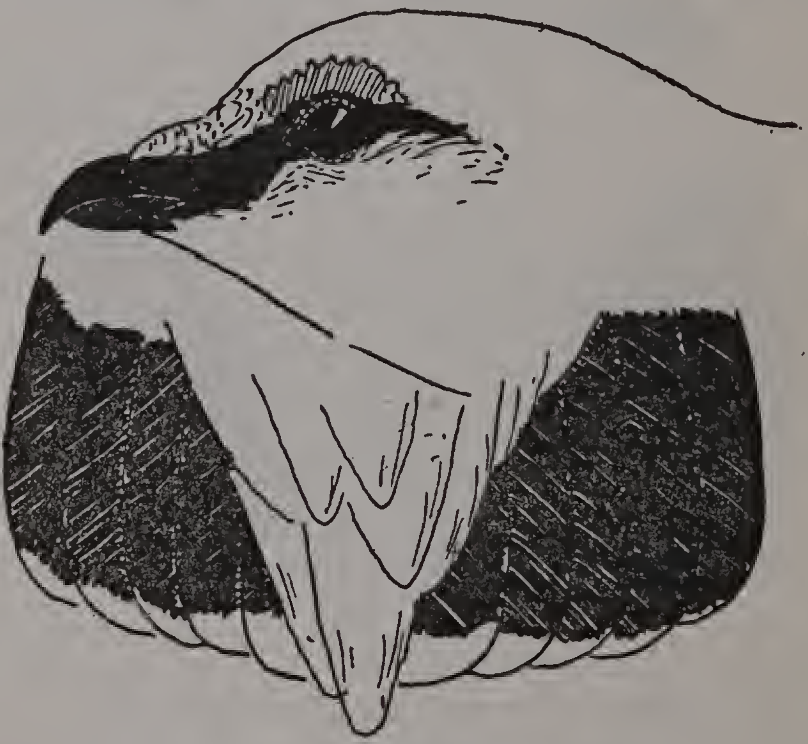


Figure 195

Specific details of Rock Ptarmigan; natural size.

Field Marks. Considerably smaller than the Willow Ptarmigan, and with more slender bill. With few exceptions recognizable by a black area in front of eye.

Distribution. A more Arctic form than the Willow or the White-tailed. Northern North America and Greenland. In America, across the continent farther north than the Willow and seldom if ever coming down into civilization even in winter. Occurs on some of the mountain tops as far south as central British Columbia.

SUBSPECIES. A number of subspecies are recognized, several being credited to Alaska. Throughout western Canada but one race, the Arctic Ptarmigan, the typical form *Lagopus rupestris rupestris,* is recognized by the American Ornithologists' Union.

304. **White-tailed Ptarmigan** (Including **Northern** and **Southern White-tailed Ptarmigan**). *Lagopus leucurus.* L, 12·50. The smallest of the Ptarmigan. In winter all white, including face and tail (Figure 196). A scarlet comb over eye is prominent in spring and may persist to a less degree at other seasons.

The summer male is coarsely barred (or blotched) with black in throat and breast and the back finely barred with black and ochre. In autumn plumage the black of the breast and foreparts is replaced (or intermixed) with finely vermiculated black and white and ochre in approximately even proportions. The back is uniformly vermiculated with the same colours in fine pepper and salt effect, the ochre predominating as in the Rock Ptarmigan, but with even more greyish overwash.

Females are more coarsely and regularly barred than males, but with less ochre, and are more of a black and white appearance than any of the other Ptarmigan. The autumn plumage shows much fine vermiculation, but is always more barred, especially on breast, than the male.

Distinctions. A small Grouse. Feet feathered to toes and white wings distinguish as Ptarmigan. The white tail separates it from either of the other species.

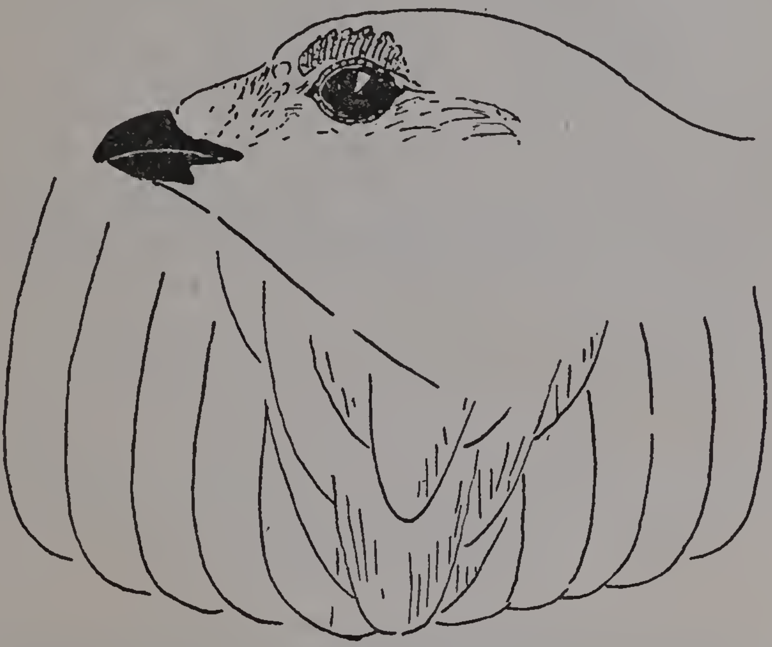


Figure 196
Specific details of White-tailed Ptarmigan; natural size.

Field Marks. As a Ptarmigan, in winter, by complete whiteness. In summer by white patches on body plumage and white wings and tail. As a White-tailed in any plumage by white tail.

Distribution. Mountains of Alaska, British Columbia, and adjacent Alberta southward to New Mexico. A mountain bird rather than an Arctic one. Only regularly found above timber-line, and of somewhat erratic and discontinuous distribution.

SUBSPECIES. Two subspecies are recognized in Canada. The Northern White-tail *Lagopus leucurus leucurus,* of Alaska, Yukon, and northern British Columbia and the Southern White-tail *Lagopus leucurus altipetens,* of southern British Columbia and southward. The latter is buffier and less grey in the autumn plumage.

305. **Prairie Chicken** (Including **Northern Prairie Chicken**). PINNATED GROUSE. SQUARE-TAIL. *Tympanuchus americanus.* L, 18. Plate XXIII A. A large prairie Grouse with a short, rounded tail, a group of stiff, straight feathers covering an inflatable sac on sides of neck; body heavily barred in brown and white.

Distinctions. To be mistaken only for the Ruffed or the Sharp-tailed Grouse. Easily distinguished from the Ruffed by the short, solidly dark tail, the lack of small eye-spots on back, and the replacement of the soft ruffs on sides of neck by stiff straight feathers. Separated from the Sharp-tailed Grouse with which it is most often confused by the stiff feather neck ornaments and by being regularly and completely barred all below instead of V-marked; and the tail evenly rounded instead of ending in a soft, flaccid point.

Field Marks. Easily recognized from the Ruffed Grouse by open instead of woodland habitat, short, evenly dark tail and stiff straight feathers instead of soft ruff on neck. From the Sharp-tailed Grouse recognized by heavy barring all below, and short, even, rounded tail.

Distribution. Central North America from Canada south. Not an original inhabitant of Canada, but it has come in within historical times. It is now common throughout the prairies of Manitoba and is gradually spreading westward through Saskatchewan and Alberta.

SUBSPECIES. The Northern Prairie Chicken *Tympanuchus americanus americanus* is the only form recognized in Canada.

Considerable confusion accompanies the name of "Prairie Chicken". This, however, is the bird to which the name applies correctly both historically and by habitat. It is a true bird of the open and not a brush species like the Sharp-tailed Grouse, which in Canada has largely usurped the title. It is a bird that, given fair protection, thrives near settlements, and evidently has followed the great grain fields northward. It is migratory and moves southward in the winter. In the spring it resorts to dance grounds such as a bare knoll or some similar spot of not very evident qualifications, but which is used for the purpose year after year and by generation after generation as though it had some special and unique attraction. The early morning is the time of activity and large numbers of birds gather and execute a most elaborate and interesting mating ritual. The male has, under the stiff plumes, large inflatable sacs on on each side of the neck, coloured bright orange and capable of enormous distention, swelling out like a small orange on either side of the throat. With these inflated, the stiff plumes over them spread finger-wise upwards and outwards, and the tail opened over the back, the bird struts and utters a succession of low, intense, hollow sounds that can be heard for miles. All spring and early summer this dull reverberating sound can be heard near its haunts, filling the air with a heavy throb but difficult of location as to direction or distance. The species is a good strong flyer, lies well to a dog, and is wary enough to satisfy exacting sportsmen.

308. **Sharp-tailed Grouse** (Including **Northern, Prairie,** and **Columbia Sharp-tailed Grouse**). (Incorrectly PRAIRIE CHICKEN.) *Pedioecetes phasianellus.* L, 17·50. Plate XXIII A. A large Grouse palely coloured in browns, ochre, and white, with many sharp, dark, V-marks on breast and flanks and with a soft, pointed, almost white tail. No particular neck ornaments or plumes.

Distinctions. The general lightness of colour, short, sharp tail and distinct V-marks on breast are too characteristic to be confused with any other bird. Most like the true Prairie Chicken, the Pinnated Grouse, or Square-tail. The nearly white tail with upper coverts lengthened, projecting, and brought to a fine taper produce the effect of a sharply pointed tail; this, the profusion of sharp V-marks on breast and flanks, and the absence of any specially developed feather groups on the side of the neck are absolute distinctions from the dark, round tail, heavily barred breast, and stiff feather neck ornaments of the Prairie Chicken proper.

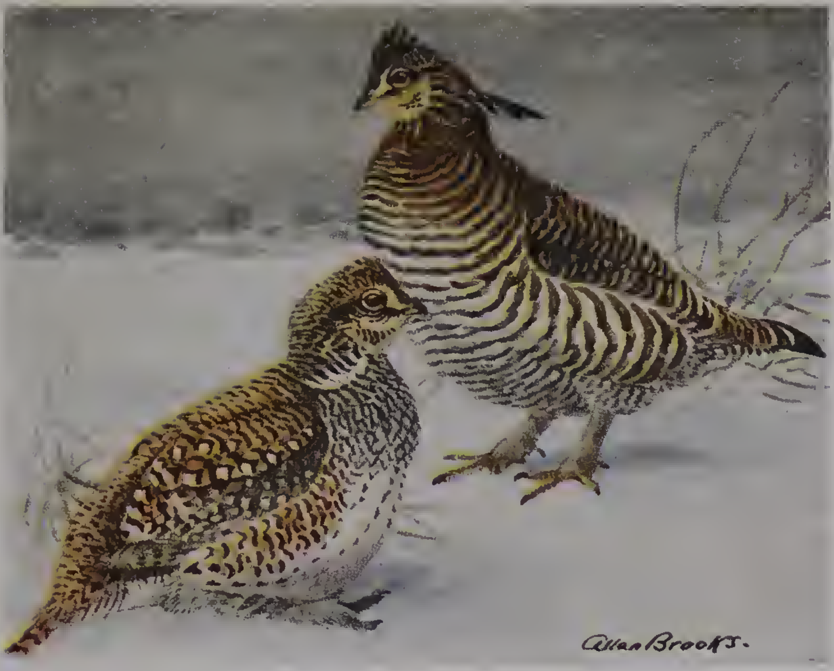
Field Marks. A light-coloured Grouse, sharp-tailed; very light below, with many dark V-marks on breast and flanks and no special neck plumes or ornaments.

Distribution. The more open spots in the spruce woods across the continent. In the west, south across the prairies and British Columbia to south of the International Boundary.

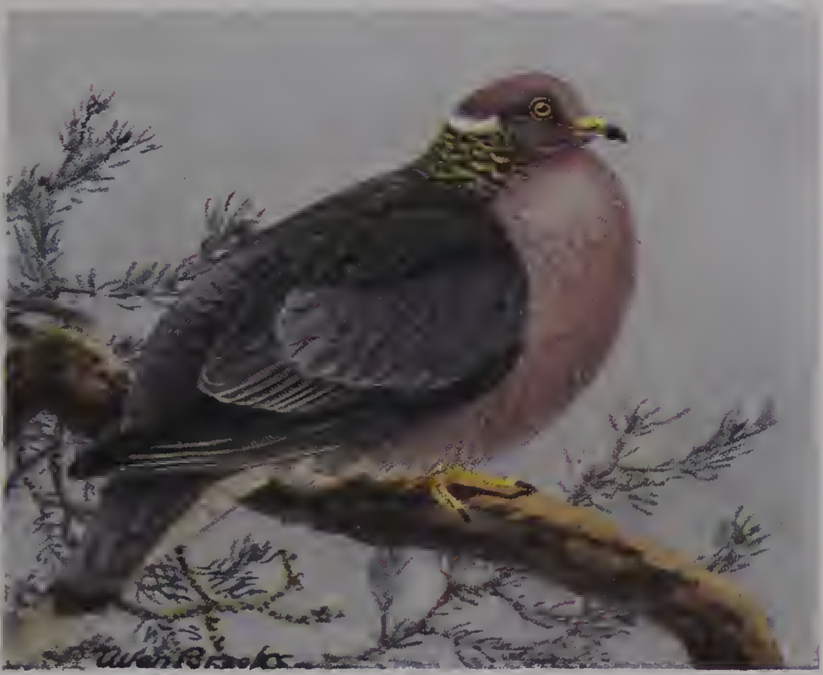
SUBSPECIES. Several subspecies of Sharp-tailed are recognized. The Northern Sharp-tailed *Pedioecetes phasianellus phasianellus,* a slightly dark form, ranges across the north woods from New Quebec to Alaska. The Prairie Sharp-tailed *Pedioecetes phasianellus campestris,* a generally creamy-coloured bird, occupies the prairies and the Columbian Sharp-tailed *Pedioecetes phasianellus columbianus,* a slightly greyer bird, is the form of southern British Columbia. The boundaries between the northern and the southern forms have not been quite accurately defined.

This is the Grouse of the Canadian prairies and in consequence, as stated under the previous species, has been consistently misnamed "Prairie Chicken," a title already pre-empted by another species. The Sharp-

PLATE XXIII



A. Sharp-tailed Grouse; scale, $\frac{1}{6}$ Prairie Chicken; scale, $\frac{1}{6}$



B. Band-tailed Pigeon; scale, $\frac{1}{4}$
Male

tailed is a bird of the brush and light timber rather than the prairie, but is not a deep woods species like the Ruffed, nor a mountain one like the Blue.

In the autumn it gathers in large flocks and has been blamed for eating grain in the stook and doing some damage. Careful investigation shows that unless the ground is covered with snow the birds prefer feeding on waste grain in the stubble to that in the stooks. They like to perch on such small eminences to enjoy the sun or for outlook when the flock is feeding in the stubble. The larger proportion of food in the crops of a number of birds shot in seemingly incriminating circumstances in freshly stooked wheat fields, consisted of weed seeds, especially bindweed, waste fruit, and vegetation, showing that they are not partial to grain, when other food is available. On the other hand both this and the previous species are notable grasshopper devourers and probably in this capacity are worth many times the loss they inflict. On the whole this is a most valuable bird from both sporting and agricultural standpoints.

309. **Sage Hen.** *Centrocercus urophasianus.* L, 26. A very large Grouse finely marked in dull white and browns without much evident pattern, giving a general creamy-brown effect, with a dark brown abdominal spot and a rounded variegated tail of sharply pointed feathers (Figure 197).

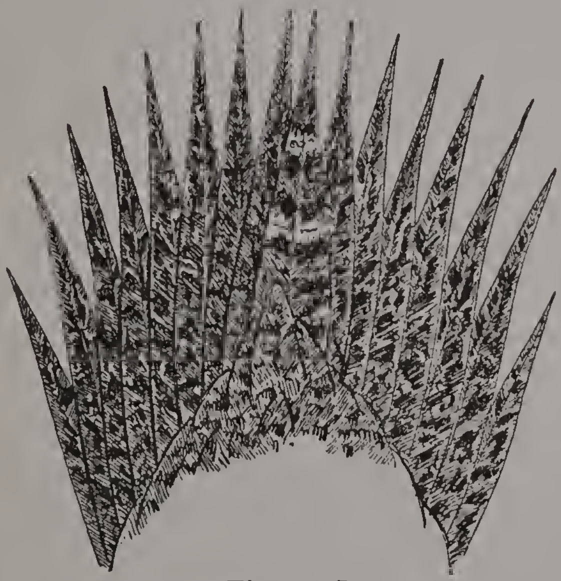


Figure 197
Tail of Sage Grouse; scale, about ⅓.

Distinctions. Large size, general colour effect of the Sharp-tailed but with finer and less decided pattern, tail of all sharply pointed feathers, and dark abdominal patch. Unmistakable for any other species.

Field Marks. Large size, general pale brown coloration, with dark abdomen and tail like a section of a many pointed star.

Distribution. Across the sage brush plains from the Canadian border south to New Mexico. This species occurs in Canada only along the southern borders of western Saskatchewan and eastern Alberta. At one time it occurred as a straggler in the southern part of the Okanagan valley of British Columbia.

This fine big Grouse occurs on the sage brush plains of the higher arid prairie steppe. Much of the ground it inhabits is useless for anything but grazing and this is probably all that has saved it to us. The species still exists in limited numbers in out of the way localities. In general the large ranch holders have shown an admirable spirit of protection towards it and have done much to perpetuate the species. As a table bird the Sage Hen is not very desirable as it is apt to be too strongly impregnated with sage to be palatable. In the spring the male Sage Hen like many other Grouse executes a most interesting mating dance. In it the star-shaped tail is opened to its fullest extent and thrown over the back, so as to give the appearance of a many rayed flower and the under coverts are fluffed. A throat sac is inflated and the body is bowed down to the ground. It is to be hoped that the few individuals of this most interesting bird, remaining in Canada, may be preserved.

Order—Columbae. Pigeons and Doves

This order, of world-wide distribution, is variously divided by different authors. According to the system of classification of the American Ornithologists' Union all our American species are included in the one family, *Columbidae.* They are the most typically pigeon-like in form and, therefore, may be called the True Pigeons.

FAMILY—COLUMBIDAE. TRUE PIGEONS AND DOVES

Pigeons and Doves may in a general way be said to resemble in outline and actions our familiar domestic stock. Characters are more easily felt than described. Systematically, they may be recognized by their bills. These are hard and horny at the tip, which is very slightly enlarged. The basal half is furnished with a soft, slightly swollen membrane in which the nostrils open (Figure 35, page 29). The legs and feet are weak, fitted only for walking over small level areas or for simple perching. Our common domestic Pigeons, descended from the Rock Dove of Europe, show the most distinctive characteristics of the family. There are no recognizable or taxonomic differences between the so-called Pigeons and Doves.

312. **Band-tailed Pigeon.** *Columba fasciata.* L, 16. Plate XXIII B. The largest of our Pigeons, resembling in general outline and build the common domestic inhabitants of our dovecots.

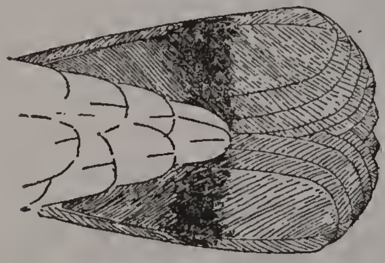


Figure 198
Tail of Band-tailed Pigeon (under side); scale, ⅓.

Distinctions. Easily separated from the Mourning Dove and Passenger Pigeon by its large size, bluish colour, and broad, rounded (Figure 198), instead of long, pointed, tail. From the White-winged Dove, which has a similarly shaped tail, by its greatly superior size, bluish to purple general colour, and the lack of white patch on wings.

Field Marks. Evident Dove appearance, round tail, large size, and general blue coloration. Separated from the domestic Dove by its habitat and readiness to alight in trees.

Nesting. Platform of sticks in dense shrubbery.

Distribution. In Canada west of the Coast range north at least to Bella Coola; west in the United States to central Colorado and south to Central America.

SUBSPECIES. All birds except those of Lower California are referred to the type form *Columba fasciata fasciata.*

The Band-tailed is the Pigeon of the west coast. Its large size makes it a rather valuable table bird, but it has not been hunted much nor seriously reduced in numbers in Canada. In the United States it has been pursued in winter to such an extent as to seriously deplete its numbers and arouse some anxiety regarding its future. Since adequate protective measures have been established, it seems to be recovering satisfactorily.

In the spring the species forms vast flocks that move irregularly about; and considerable more or less justified complaint against them comes from farmers whose newly sowed crops they have settled upon. It does not seem that they commonly take other than surface grain, and drilling it in should normally afford ample protection against damage to small grain. They are especially partial to peas and are said to pull up the sprouting seeds. The flocks so engaged are described as being numerous enough to turn the colour of the fields they alight upon from brown to blue. As they are large birds, each one intent on filling a capacious crop, their power for damage is not small. In the autumn they alight on the stooked grain and may take a considerable toll of it. It is fortunate that the birds are very irregular and local in their habits. One field may suffer one season, whereas others, apparently equally attractive, are untouched. The next season appreciable flocks may be totally absent from the neighbourhood and appear in an unexpected quarter. In British Columbia, at least, there is at present no fear for the survival of the species and when it becomes at all numerous its numbers can easily be reduced. They are exceedingly wary and with us seem well able to take care of themselves.

Periodically old-time eastern Pigeon-hunters note this western species and exultantly proclaim the rediscovery of the Passenger Pigeon that dropped from sight so suddenly as to suggest change in range rather than extermination.. Unfortunately no such explanation can be accepted and the merest comparison of the long, slender, rosy-breasted Passenger Pigeon with this heavy, round-tailed, purplish bird shows the error of the supposition.

315. **Passenger Pigeon.** WILD PIGEON. *Ectopistes migra orius.* L, 16·29. Plate XXIV A. Larger than the Mourning Dove, but smaller than the Band-tailed, though measuring more through its long, tapering tail (Figure 199). Much like the Mourning Dove in colour and outline, but more richly coloured.

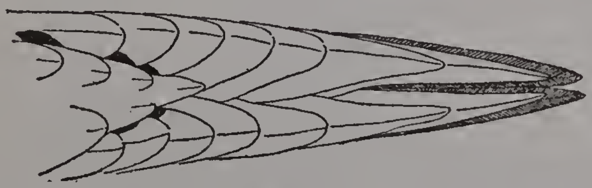


Figure 199
Tail of Passenger Pigeon (under side); scale, ⅓.

Distinctions. The Passenger Pigeon was never more than a straggler west of the mountains, but as the Mourning Dove has been so often mistaken for it the following distinctions should be noted. It was considerably larger than the Mourning Dove—wing 8 inches or over instead of 6 inches or under. Females and juveniles similar to the Mourning Dove in colour, but the adult male had a decidedly red throat and breast, was slate-blue on head and back, and never had the small black spot below the ear that is characteristic of the Mourning Dove. Only two middle tail feathers were dark to the tip instead of four (compare Figure 199 with 200).

Field Marks. The species being extinct, field marks are unnecessary.

Nesting. In rough nest of sticks in trees, in large communities.

Distribution. Bred formerly in the wooded sections of Canada east of the mountains, from Mackenzie valley to the east coast and southward. Wintered in the southern states. Once common in Manitoba, but last recorded in 1898. Records for the southern parts of the other Prairie Provinces are few and unsatisfactory. The species is now extinct, the last bird having died in captivity in 1914.

The immense flocks of Passenger Pigeons that once darkened the air were one of the wonders of America. The descriptions of their number, if they were not circumstantial and well vouched for by men of undoubted veracity, would sound like wild stretches of the imagination; flocks, so dense that haphazard shots into them would bring down numbers, travelled rapidly with a front miles in width and so long that it took hours to pass a given point. Audubon estimates one such flock as containing over a billion birds, basing his figures upon the density and area of the congregation and not by mere guess. They bred in dense rookeries where their weight often broke the branches from forest trees. Trees containing their nests were cut down and though each nest contained only one squab there were so many that the pigs were turned in to feed upon them. Later, the netting of pigeons was the occupation of professional fowlers who shipped their proceeds by the car-load to the centres of population. Of course, not even the immense numbers of the Passenger Pigeons could stand such attacks without diminution. To suggest a halt in the proceedings at that time, however, aroused nothing but ridicule, their numbers being held to be inexhaustible, but today the species is extinct and the single survivor, a captive bird, died in Cincinnati a short time ago. The last great rookery was near Petoskey, Mich. In the autumn of 1878 the birds left on their usual migration, but failed to return in commercial numbers the following spring. For a few years afterwards occasional small flocks were seen and isolated rookeries were reported, but as the fowlers investigated each case it became apparent that the netting of pigeons as an occupation was a thing of the past. Thereafter, the birds became fewer and fewer each year until they disappeared altogether. There are occasional rumours even yet of flocks occurring in out-of-the-way places, in the western mountains, in Mexico, or South America, and elsewhere, but in each case investigation has proved that the reports are based on other species or on misinformation. For several years a large reward was offered for news of a single nesting pair. Of course, the author of the reward was flooded with reports, but not a single case stood examination, the reward was never earned, and was finally withdrawn. In the east, the Mourning Dove was the usual basis of report, in the west the Band-tailed Pigeon. Even yet rumours and circumstantial accounts of Passenger Pigeons still extant appear from time to time, vouched for by those who remember the bird in their childhood, but there is little doubt that the species is extinct.

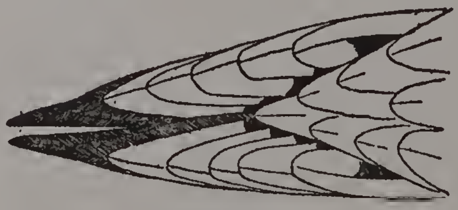
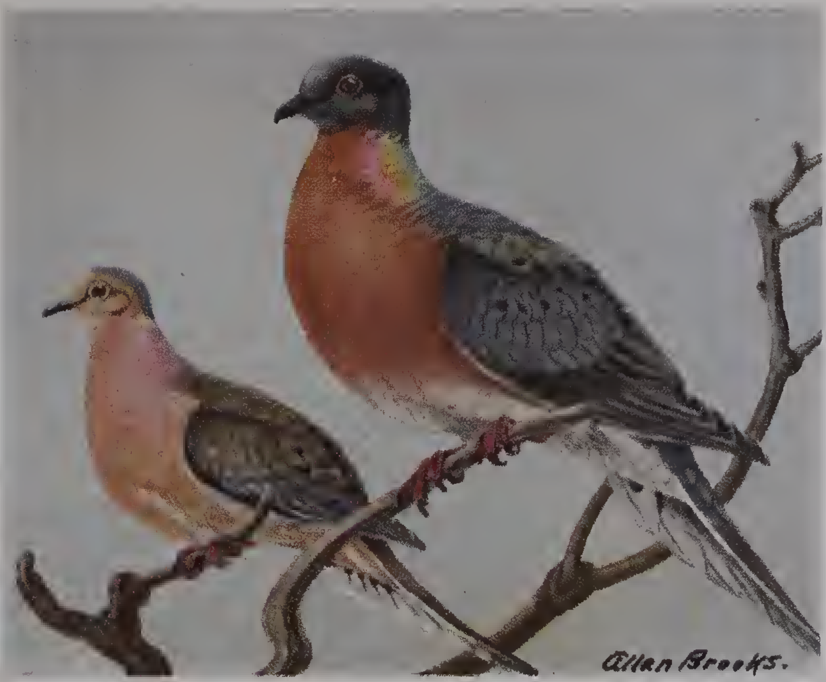


Figure 200
Tail of Mourning Dove (under side);
scale, ⅓.

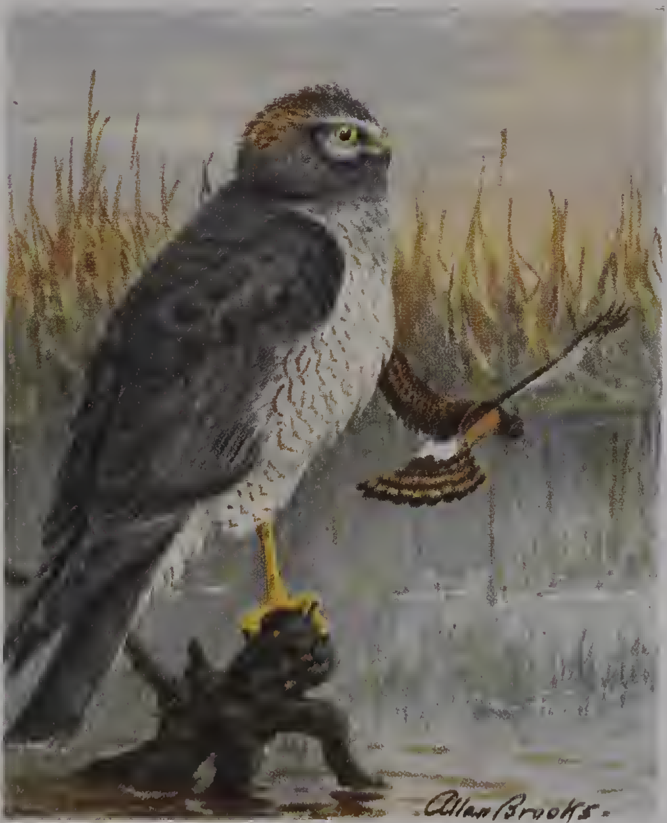
316. **Mourning Dove** (Including **Western** and **Dusky Mourning Doves**). CAROLINA DOVE. *Zenaidura macroura.* L, 11·85. Plate XXIV A. A small Pigeon with a pointed tail much like the Passenger Pigeon in colour and outline, but duller in colour.

Distinctions. The Mourning Dove occurs nearly all over the southern parts of Canada. It is easily separated from the Band-tailed Pigeon of the west coast by its smaller size, fawn coloration, and long, pointed tail (Figure 200). It is often mistaken for the

PLATE XXIV


Allan Brooks.

A. Mourning Dove; scale, $\frac{1}{4}$ Passenger Pigeon; scale, $\frac{1}{4}$


Allan Brooks.

B. Marsh Hawk; scale, $\frac{1}{6}$

Adult male Juvenile

extinct Passenger Pigeon, but is considerably smaller than that bird—wing under 6 inches instead of over 8. It is similar in colour to females and juveniles of that species, but quite distinct from adult males. The breast is light purplish pink instead of distinctly red, the head is pale fawn colour with but little bluish cast, the back is olive-fawn, and there is in all but the most immature plumages a small black spot on the side of the neck below the ear. Four middle tail feathers are dark to the tip (compare Figure 200 with 199).

The White-winged Dove has occurred on Vancouver island and is a bird of similar size and colour. It has a round tail, however, and a large white patch on the wings that this species never has.

Nesting. A loose nest of sticks in brushy thickets, occasionally on the ground. Nests alone and not in communities.

Distribution. North America, from southern Canada to Panama and the West Indies.

SUBSPECIES. The type form of the species inhabits the West Indies and some of the adjoining mainland. The subspecies of eastern North America is the Carolina Mourning Dove *Zenaidura macroura carolinensis.* Throughout most of the west the Western Mourning Dove *Zenaidura macroura marginella* occurs. It is paler and greyer in colour and slightly larger in size than the eastern bird, but the difference is slight, and one of averages rather than individual specimens. If the form is demonstrable, it extends east in Canada to include Manitoba. A dark, heavily coloured form, the Dusky Mourning Dove *Zenaidura macroura caurina*, has lately been officially recognized from the coast of Oregon and would be the one most likely to occur on the southern British Columbia coast.

Though the Passenger Pigeon has disappeared entirely, the smaller Mourning Dove still exists and probably has greatly increased with the clearing of the country. The general food habits of the two birds were much alike except in the proportion of the various food elements. The Mourning Dove eats mast readily, but mast formed the principal food of the Pigeon which was, therefore, more of a woodland bird. The Mourning Dove is of more solitary habits and rarely goes in flocks of any size. It nests entirely alone. This may be a large factor in its continued existence where its larger and originally more numerous relative has failed. Disease could not spread through the ranks so thoroughly and any other calamity that might affect individuals or small bodies would not involve the species as a whole. In many sections the Dove is regarded as a game-bird, but such status is not recognized by law anywhere in Canada. Numbers are killed, however, incidental to other sport, in spite of legal protection, and the life of the species is not an undisturbed one. It is, however, a strong and thriving race and is in little immediate danger.

Its long-drawn mournful note of ''*Oh-woe-woe-woe*'' is well known and has given the name to the species. It has a peculiar quality like that produced by blowing softly into the neck of an empty bottle.

Economic Status. Though feeding largely upon mast (acorns, beechnuts, and other soft-shelled tree-fruit) it eats grain readily and a considerable amount of insect food and weed-seed. Most of the grain it takes is waste. Seed properly planted and covered is absolutely safe from it for it never scratches. No serious unpreventable harm can be proved against it and the good it does is positive.

319. **White-winged Dove.** *Melopelia asiatica.* L, 12. Similar to the Mourning Dove in size and general coloration, but with a round tail and much white on the wings.

Distinctions. A Mourning Dove with a round tail white-tipped except for the centre feathers, and a pronounced white patch on the wings including secondaries and their coverts.

Field Marks. A Mourning Dove with above characters.

Distribution. Southeastern California east to Texas and southward. Also Florida and some of the West Indies. Casual visitor northward on the coast and single records for the state of Washington and southern Vancouver island.

SUBSPECIES. The western form *Melopelia asiatica trudeaui* is the only one to be expected in western Canada.

To be identified only with great care, by unmistakable evidence or actual specimen.

Order—Raptores. Birds of Prey

General Description. Flesh-eating birds with four well-developed toes (Figures 31 and 32, page 28), each armed with a strong sharp claw or talon for seizing and holding prey. Bill is hooked (Figures 30, 33 a and b, and 34, pages 28 and 29), and the base covered with a swollen soft skin or cere in which the nostrils are situated. The Birds of Prey differ from the generality of birds in that the females are considerably larger than the males. This is probably due to the greater strain placed upon the female in feeding her young. This greater responsibility, demanding strength, weight, and endurance rather than fine technique, necessitates a higher development of these qualities in the female than in the male who, although he may assist his mate, has not the final responsibility for the growing family.

Distribution. Raptorial birds are distributed over all the world except the Antarctic continent, where their place is taken by the Skuas, Gulls, and other rapacious sea-birds.

Though the classification of this order is far from satisfactory and probably will be revised, American practice divides our species into three suborders: *Sarcorhamphi*, the American Vultures, distinct from those of the Old World; *Falcones*, the Diurnal Birds of Prey; and *Striges*, the Nocturnal Birds of Prey or Owls.

Economic Status. Perhaps no birds are better known and at the same time so generally misunderstood in their economic relations as these. All know of the Hawks, Owls, and Eagles and their flesh-eating propensities, but few realize that amongst them are some of man's best friends and that the popular policy of killing them indiscriminately is a mistaken one. Some do considerable damage, but to include all in the condemnation merited by the few is a grave economic error. The first family, the Vultures, are repulsive birds, but as scavengers exceedingly useful, and no valid complaint can be lodged against them. Of the other two divisions, the Diurnal and Nocturnal Rapaces, their mixed status is the cause of much misconception. Fortunately in regard to these birds we can speak with authority based upon actual data and not mere speculation. The United States Biological Survey made a thorough study of the food habits of American Hawks and Owls, basing its conclusions upon the examination of about 2,700 stomachs taken in all seasons of the year in various parts of the United States and Canada. The whole, with the data for its substantiation, is embodied in a report, "The Hawks and Owls of the United States," by Dr. A. K. Fisher.[1]. Although compiled in and for an adjoining country all Canadian species are treated, and the results are as applicable to Canada as to the United States. As some of the less harmful species do not occur in Canada the following percentages should be slightly altered for our use, but not enought to modify perceptibly the general conclusions. Only six of the seventy-three species studied are injurious. Of these, three are extremely rare in Canada, and one is altogether a fish-eater. Of the remainder, 56 per cent of the stomachs examined contained mice and other small mammals, 27 per cent insects, and only 3½ per cent poultry or game-birds. Dividing the 33 raptorial birds of western Canada into groups according to their economic status we find that four species are wholly beneficial and absolutely harmless; seventeen are mainly beneficial, doing decidedly more good than harm; six are about balanced in their effect; and six are positively harmful. Only three of these six are common enough to warrant consideration and only two, the Sharp-shinned and Cooper's Hawks, are numerous enough in the thickly settled communities to be noticed. The Goshawk is a more northern species whose distribution overlaps the edges of settlement on the north or in the mountains.

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[1] See also "The Hawks of the Canadian Prairie Provinces in Their Relation to Agriculture," Geol. Surv., Can., Mus. Bull. 28, 1918.

In making these generalized estimates, it should be understood that they are based on averages of the whole country throughout the year. Local conditions, time of year, and the particular interests of the locality may modify the conclusions. For instance, the Red-tailed Hawk, in summer time on the open prairie, is just as efficient and indefatigable a gopher killer as the Ferruginous Rough-leg; in the autumn when gophers have holed up, and the young, inexperienced Hawks are seeking easily captured prey, game and poultry may in some cases suffer slightly from their attack. The Bald Eagle is only a rare picturesque feature of the landscape over most of Canada, but on the coasts it is often seen in greatly increased number and may be a serious enemy of water-fowl. The Marsh Hawk is an inverterate mouser, but in early summer the abundance of young upland and marsh game has attractions for it. Just where to draw the line between generally beneficial and harmful species is thus sometimes difficult to decide.

Raptorial birds, like human beings, tend to subsist on that which is first to hand, and a generalization based on one set of conditions will not always hold good for others. It is also a natural psychological fact that we ourselves feel a definitely known, concrete loss more keenly than we do a much greater one that we have more or less unwittingly escaped. The loss of a single partly grown chicken to Hawks is more keenly realized than the absence of some hundreds of gophers that never intruded themselves upon our consciousness. The one fact is taken as a calamity, the other as a matter of course. It is such warping of judgment that we must particularly guard against in estimating the real value of our Birds of Prey.

However, the so-called balance of nature has been profoundly disturbed by civilized man's appearance on the scene, and the new balance in process of establishment may not be altogether to his liking. Civilization itself is an unnatural condition, a disturbed balance, and to be retained only by constant interference with nature's attempt to return to a more primitive order. Such interference may be absolutely necessary, but, unguided by comprehensive understanding of the complicated action and reaction in nature's economy, it is likely to be bungling and, like prodding the works of a fine watch without understanding its mechanism, cause evil greater than that which it is intended to correct. When, however, a species increases to numbers detrimental to man's interest, it is expedient and justifiable to reduce them. But in doing so we should take heed of what we undertake and assure ourselves that worse evils will not follow. We have largely eliminated the coyote and fox as threats to our flocks, and have thereby removed an active check on the gophers and ground-squirrels. Some species of Hawks do more damage than good to us and can well be destroyed, but care should be taken that discrimination be shown and that the harmless or useful ones, the remaining efficient natural control of rodent pests, be not involved.

The difficulties of recognizing the various species of Hawks and discriminating friend from foe are considerable. However, a few rules will assist. All black Hawks are positively beneficial. Most summer Hawks on the prairies are to be regarded as beneficial unless actually taken in a harmful act. Those of late autumn or winter may be treated as harmful without much danger to innocent species.

SUBORDER—SARCORHAMPHI. AMERICAN VULTURES

This suborder is composed of the American Vultures which are systematically quite distinct from those of the Old World. One family only is represented in Canada, *Cathartidae* the Turkey Vultures. Vultures are carrion feeders, relying upon dead meat and not capturing living prey unless it is in the last stages of exhaustion. Ordinarily, they touch nothing but decaying flesh. This is usually regarded as a matter of choice, but may be a necessity, as their feet are not formed for grasping and the bill is comparatively weak. They may, therefore, be unable to break into large, sound carcasses and are forced to await the decay which renders the subject less refractory.

FAMILY—CATHARTIDAE. TURKEY VULTURES

General Description. Large birds, uniformly nearly black in coloration. Bill is comparatively long and less strongly hooked than in remainder of the *Raptores* (Figure 30, page 28). Head and upper neck are bare of feathers and have a superficial general resemblance to those of the Turkey, but are without wattles or warty excrescences. Feet resemble those of a Chicken rather than of a Hawk. Claws are blunt and the foot is poorly adapted for seizing or holding prey.

Distribution. Vultures are essentially birds of the warmer regions. They enter Canada only along the most southern boundaries.

Vultures cannot be observed to best advantage in Canada. In the southern United States they may be seen every hour of the day floating on motionless wings high in the air, searching the country with telescopic eye for carrion. When an animal dies (or even before) it is sighted, and a black form drops beside it from the sky; shortly it is joined by another, and another, and soon where not a bird was previously to be seen many are struggling about the unclean feast. Though dissection shows very highly developed nostrils, scent does not seem to guide the Vultures to any appreciable extent. Experiment indicates that the eyesight alone is relied upon for locating food. The flight of the Vultures is one of the wonders of the physicist. They hang suspended in the air or even rise beyond the limits of human vision, without visible effort. On motionless, outspread pinions they glide in great ascending spirals, mounting higher and higher, and then, still circling, maintain their positions for hours at a time, without a single apparent stroke of the wing. Many explanations of the phenomenon have been offered, but all so far advanced fall just short of conviction. In western Canada we have only one species.

Economic Status. The Vultures are not Birds of Prey in the usual acceptation of the term, for they do not kill what they eat but feed entirely on carrion. They have been accused, and perhaps justly, of accelerating death at times, but they never attack an animal that is not in the last stages of exhaustion. In Canada the species is of little economic importance, but in the south their scavenging is an important safeguard to the health of the more careless communities, and in many places they are rigorously protected by law for sanitary reasons.

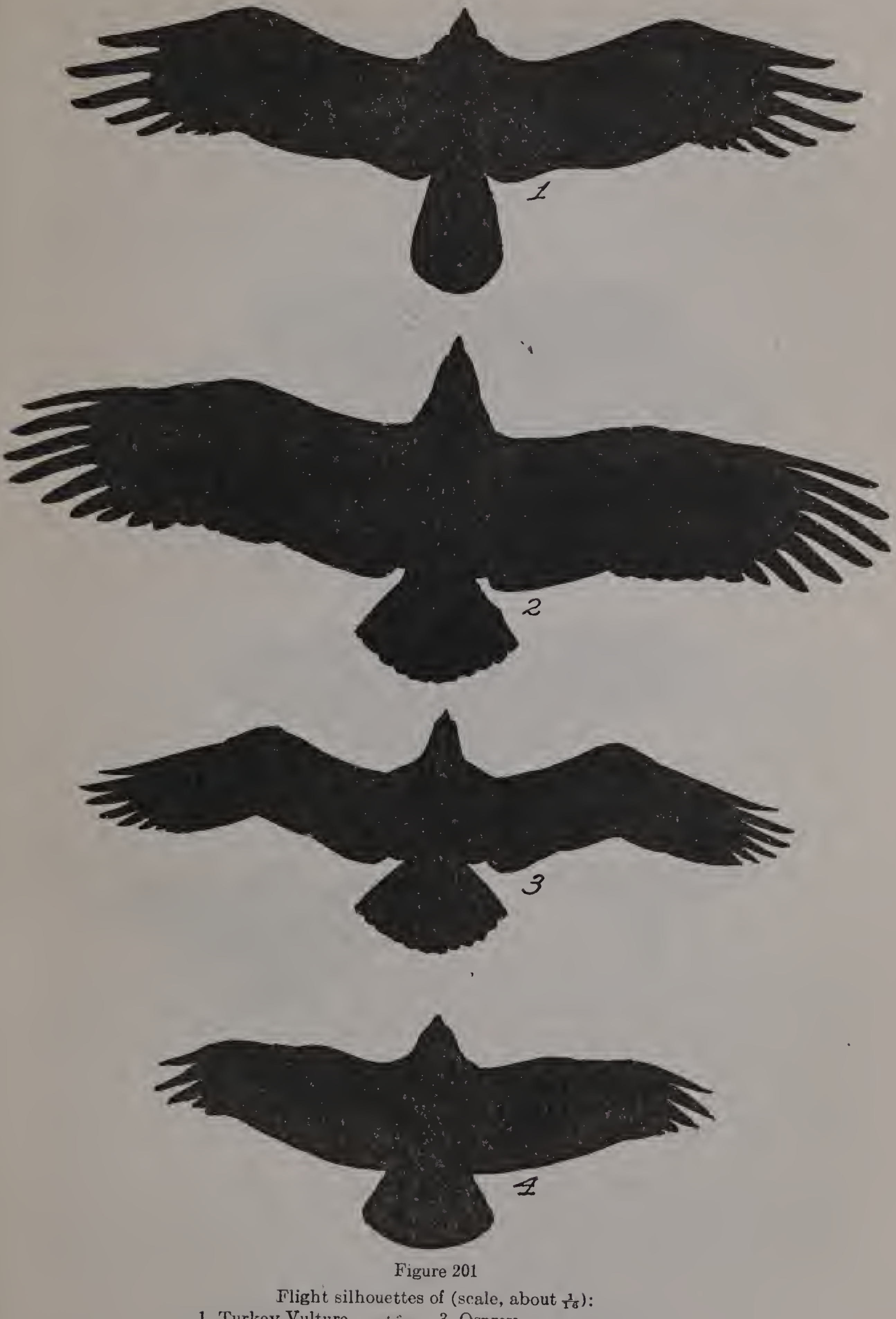


Figure 201

Flight silhouettes of (scale, about $\frac{1}{16}$):

1, Turkey Vulture
2, Bald Eagle
3, Osprey
4, Rough-legged Hawk

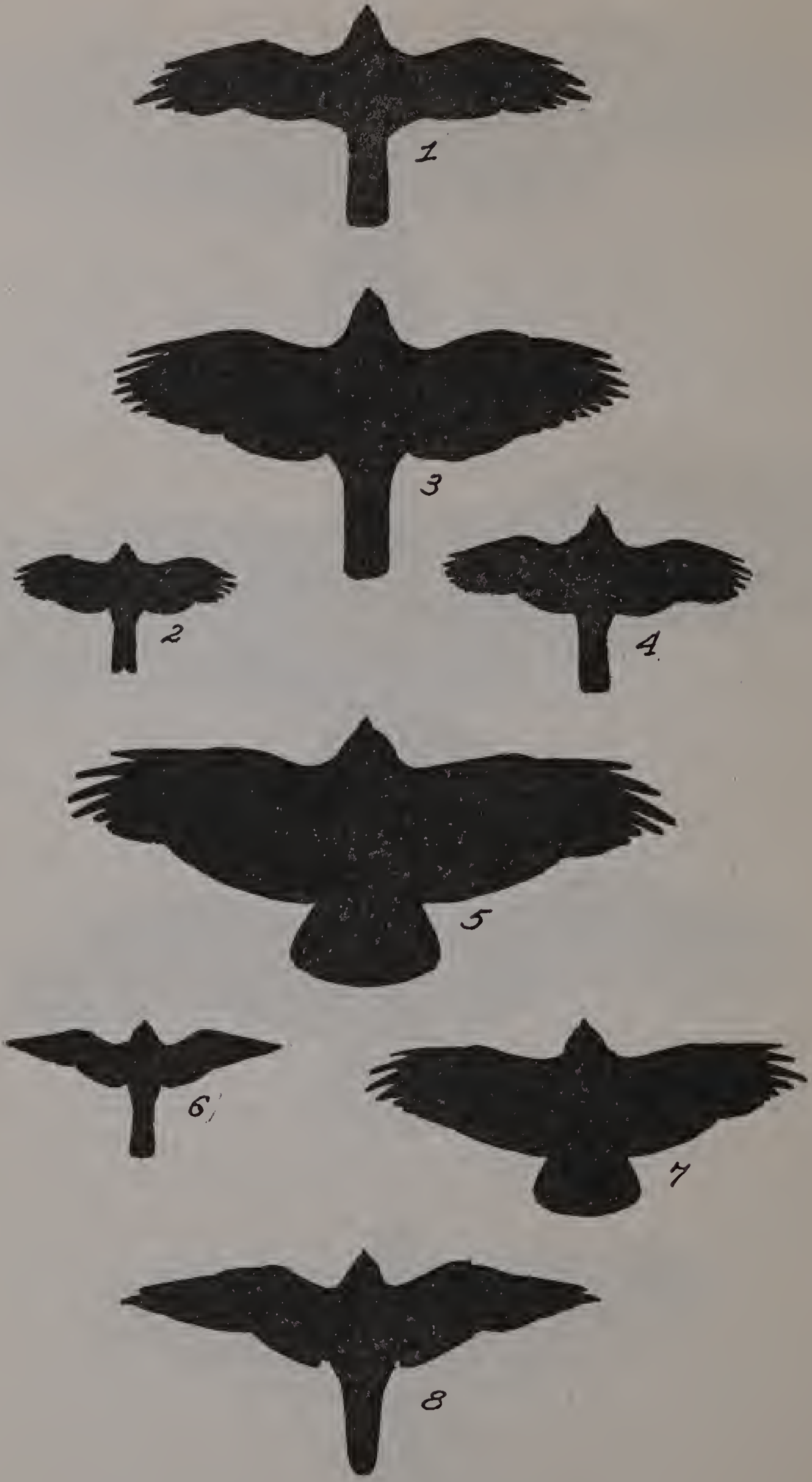


Figure 202

Flight silhouettes of (scale, about $\frac{1}{18}$):

1, Marsh Hawk
2, Sharp-shinned Hawk
3, Goshawk
4, Cooper's Hawk
5, Red-tailed Hawk
6, Sparrow Hawk
7, Broad-winged Hawk
8, Peregrine Falcon

325. **Turkey Vulture** (Including the **Northern Turkey Vulture**). TURKEY BUZZARD. *Cathartes aura.* L, 30. All dark, very nearly black, with head and neck naked or, in juveniles, covered with sparse, greyish brown, fur-like down.

Distinctions. Large size, all dark coloration, hooked beak with long extensive cere, naked or downy head coloured red in the adult (Figure 30, page 28), and weak, chicken-like rather than raptorial, claws mark it plainly as a Vulture. The Turkey Vulture is the only one likely to be seen in Canada. There is a record of the California Condor in southern British Columbia, but it seems to have an uncertain basi

Field Marks. A large black bird next in size to the Eagles (Figure 201—1), usually seen sweeping around in great circles or soaring on motionless wings high in the air. Seen from below the forepart of the wings and body is coal black and the flight feathers a shade or so lighter (Figure 203). Often the bare, red head and neck are seen as a flash of colour, making determination certain.

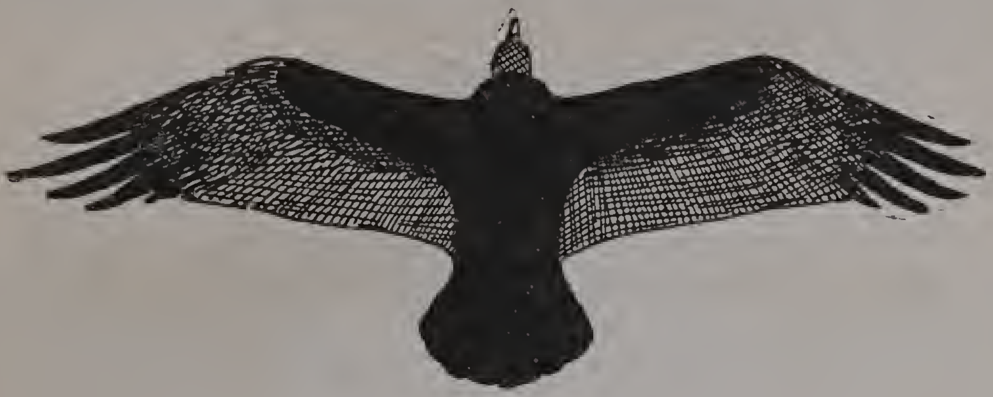


Figure 203

Turkey Vulture; scale, $\frac{1}{20}$.

Appearance in flight.

Nesting. On the ground, usually in a hollow log, or under an upturned stump.

Distribution. From along the southern border of Canada, north to Duck mountains in Manitoba, near Edmonton in Alberta, and Fraser river in British Columbia; south to Mexico.

SUBSPECIES. The North American form is the Northern Turkey Vulture *Cathartes aura septentrionalis.*

Economic Status. Being a carrion feeder no harm can be charged against the species and after winters that have been unusually severe on the cattle of the plains, they perform valuable services as scavengers of dead animals.

SUBORDER—FALCONES. DIURNAL BIRDS OF PREY

General Description. Bill strongly hooked from the base (Figure 33, page 28), where it is covered with a swollen cere or mass of yellow, waxy-looking tissue in which the nostrils appear. This tissue is distinctly softer than the bill proper and usually yellow in colour. The feet are powerful and furnished with strong claws or talons for capturing and holding living prey (Figure 31, page 28).

Distinctions. The members of this suborder differ from the Vultures in having the bill shorter and more strongly hooked and the head feathered instead of bare (compare Figure 33 with 30, page 28); and from the next suborder, the Owls, in lacking distinct facial disks (Figure 34, page 29) about the eyes. The tarsus is usually bare and the toes are never feathered.

These are the birds generally recognized as the Hawks and the Eagles. They are represented in Canada by three families: *Accipitridae,* the common Buzzard Hawks and Eagles; *Falconidae,* the true Falcons and Caracaras; and *Pandionidae,* the Ospreys or Fish Hawks.

FAMILY—ACCIPITRIDAE. BUZZARD HAWKS, KITES, HARRIERS, BUZZARDS, AND EAGLES

General Description. Hawks of various sizes, mostly easily described as being neither Falcons nor Ospreys.

Distinctions. Bill (Figure 206, compare with 229) is without notches which make, as in the Falcons, distinct tooth-like projections to the cutting edges. The feet (especially under-surface) have no distinct, sharp, hard corrugations for holding slippery prey, as in the Ospreys or Fish Hawks. Wings are short, round, and concave except in the Kites and Harriers, and their flight is comparatively heavy.

The family is composed of a number of well-marked genera, each comparatively easy of recognition. These comprise the bulk of our common Birds of Prey. Though truly raptorial in character, they have not the bold spirit, the address in attack, nor the iron endurance of the true "long-winged" or "noble" Falcons and hence were called "ignoble Hawks" by the old falconers.

KITES

The Kites are birds of southern distribution, and only one species has ever been taken in Canada.

327. **Swallow-tailed Kite.** *Elanoides forficatus.* L, 24. A rather small Hawk which measures large because of the great elongation of its outer tail feathers. These extend 8 inches beyond the middle ones. Wings and tail pure black; all remainder, including head, shoulders, and upper back, white. A bird strikingly coloured in intense black and white, with the deeply forked tail and long pointed wings of the Barn Swallow. It is hardly possible to mistake this for any other species.

Distribution. Tropical and semitropical America, appearing very rarely along our southern border.

The only records for western Canada are based on a few old observations in southern Manitoba and adjoining parts of Saskatchewan. Under the conditions of a former abundance, it evidently wandered north more frequently than it does today.

A most beautiful species, but too rare in Canada to receive more than passing reference here.

Economic Status. Its principal food is insects, snails, and reptiles; it never touches mammals or birds.

HARRIERS

The Harriers are long-winged, long-tailed Birds of Prey of light slender build and with partly feathered eye-ring somewhat suggestive of Owls. Their habitat is the open meadow and marsh, and mice are their principal prey. We have but one species in North America.

331. **Marsh Hawk.** MARSH HARRIER. *Circus hudsonius.* L, 19. Plate XXIV B. Adult male: coloured like a Gull, light slate blue above, white below, black wing tips. Juvenile: mostly reddish brown, striped with lighter below. Adult female: like juvenile, but paler and less red.

Distinctions. A partial and incomplete feathered eye-ring merely suggestive of those of the Owls, is distinctive of the species. The general gull-like colours of the adult male and the warm reds of the juveniles are characteristic.

Field Marks. A medium-sized Hawk of long, slender build. Slighter than a Broad-wing, smaller than a Goshawk, and larger than Cooper's (Figure 202—1). General coloration and the white rump which shows conspicuously in flight are the best field marks. Its long wings and tail (Figure 204) give it a somewhat falcon-like outline in flight, but its action is entirely different. The Marsh Hawk when soaring holds its wings decidedly elevated above the body instead of almost on a level with it, as do most hawks.

Nesting. On the ground in a dry spot of the marshes, or in a hayfield.

Distribution. The whole of the United States and Canada north to near the Arctic. Breeds throughout its range in Canada.

One of our commonest Hawks, being found almost anywhere in Canada. It haunts the open marshes, meadows, and fields and is to be seen beating up and down, quartering and covering the ground like a well-trained bird-dog. For an instant it hovers over its intended prey and then drops upon it, rising a moment later to alight on a fence-post or other similar slight elevation to devour its captive. The young are unsuspicious, but the blue adults are amongst the wariest of birds and fall to the gun comparatively seldom.

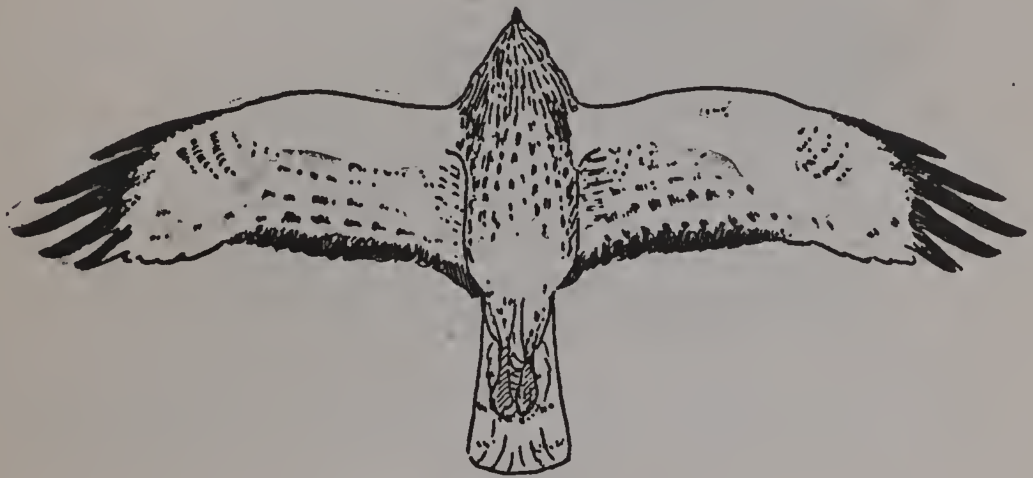


Figure 204
Marsh Hawk (adult male); scale, $\frac{1}{10}$.
Appearance in flight.

Economic Status. Of 116 stomachs examined, 7 contained poultry or game-birds; 34, other birds; 57, mice; 22, other mammals; 7, reptiles; 2, frogs; 14, insects; and 1, indeterminate matter. Thus of 144 food items 41 were harmful, 93 useful, and 10 neutral. Of the 41 harmful items, only 3 were domestic fowl, and the remainder wild stock, consisting of 46 individuals of considerably less value than the domestic varieties. The mice and other mammals included about 117 individuals. The insects were mostly locusts, grasshoppers, and beetles. The balance is evidently in favour of this species, which is incapable of taking any fowl but small ones and then only when they wander into its habitat. Keeping spring chickens close about the premises is an almost perfect protection against this bird. Haunting marshes, grassy meadows, and tangled dry sloughs, as it does, it is the natural enemy of field-mice and probably does as much to keep their numbers within bounds as any other single natural influence.

Probably on the whole, and certainly in strictly agricultural country, the Marsh Hawk is considerably more beneficial than harmful. For a few weeks in early summer, when the marshes throng with small Ducks and the young Prairie Chickens are on the uplands, it often engages in questionable pursuits and considerable numbers of half-grown game birds become its prey. However, as soon as these immatures become too large and sturdy for so light a raptore to handle, it once again turns to mice and lesser game. Except where game is the most valuable crop, its presence is to be encouraged and shooting resorted to only where its depredations are particularly serious.

ACCIPITERS OR SHORT-WINGED HAWKS

General Description. Very small to large Hawks with short, rounded wings and long tail. (Figure 202—2, 3, 4). Under-surface of primaries and secondaries regularly barred to tip. The five outer primaries emarginate (*See* Figures 205 to 212).

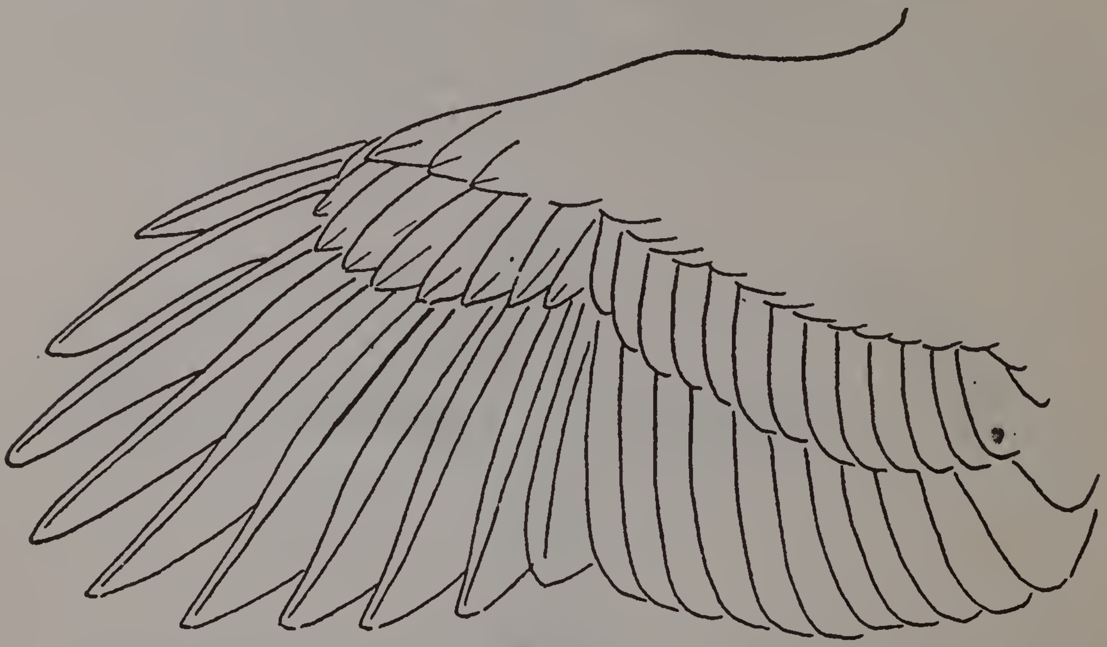


Figure 205
Round wing of Accipiter.

The Accipitrine Hawks are woodland birds that beat about the tree-tops or along the edges of the woods; they do not habitually soar high in the open. They take their prey by surprise and quick attack rather than by open pursuit. Their short wings (Figure 205) and long tail give rapid bursts of speed and flexibility of manœuvre, but are not suited to long-sustained effort.

Economic Status. These are the only common species of Canadian Hawks for which little good can be claimed. They are active and spirited and though without the great strength and endurance of the true Falcons do far more real damage than their larger and heavier relatives. The term "Chicken Hawk" popularly applied to any small Hawk receives its meaning from these birds. They never eat carrion but always make fresh kills, rarely returning to partly devoured prey. Fortunately the two commoner species are small and their capacity for damage is slight in consequence. The one large and powerful member of the group, the Goshawk, is of more limited distribution and, except in unusual winters, is less commonly seen in the more settled parts of southern Canada, except in the mountains where elevation brings northern conditions within easy flight distance of agriculture.

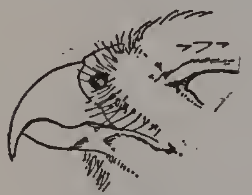
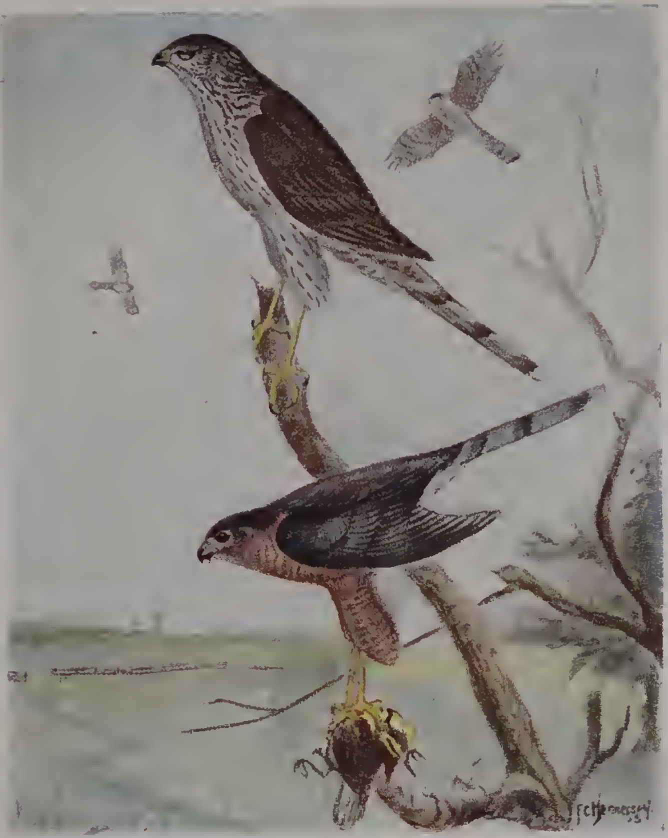


Figure 206
Untoothed Bill of Accipiter.

332. **Sharp-shinned Hawk.** CHICKEN HAWK. *Accipiter velox.* L, 11·25. Plate XXV A. The smallest of the Accipiters. About the size of the Sparrow Hawk and Pigeon Hawk (Figure 202—2). Similar in colour and plumage sequence to Cooper's Hawk. In juvenility: striped with dark brown and white; adults: back dark blue and breast barred with dull reddish and white.

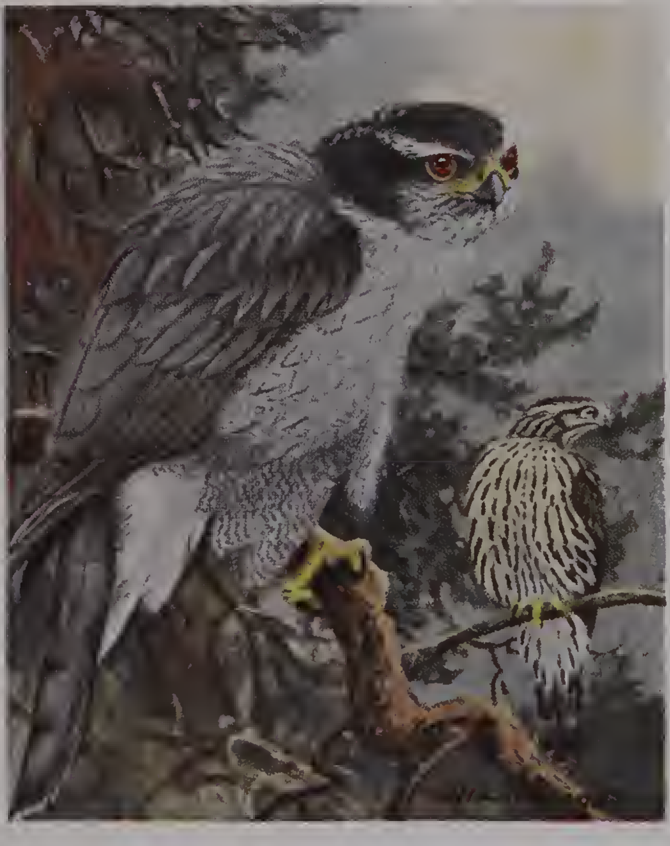
PLATE XXV



A. Sharp-shinned Hawk; scale, $\frac{1}{7}$

Juvenile

Adult male



B. American Goshawk; scale, $\frac{1}{6}$

Adult Juvenile

Distinctions. By small size to be confused only with the Sparrow Hawk, Pigeon Hawk, and Cooper's Hawk. Easily separated from the first by lack of red on back and tail and from it and the Pigeon Hawk, which are both true Falcons, by its short, rounded wings and untoothed bill (Figures 205 and 206, compare with 228 and 229). Usually separated from the Cooper's Hawk by its smaller size, but a large female may measure closely to the size of a small male of that species. A bird under 14 inches long will be a Sharp-shin; over 16, a Cooper's. The tarsus of the Sharp-shinned is comparatively longer and more slender than that of Cooper's and the tail is square or slightly forked when closed (Figure 208) instead of rounded (Figure 209).

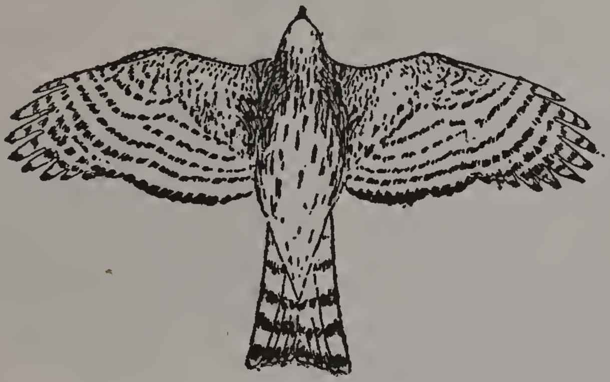


Figure 207
Sharp-shinned Hawk (juvenile); scale, ⅛.
Appearance in flight.

Field Marks. Short, round wings regularly barred below; long tail (Figure 207); and flight—when not under a burst of speed a series of alternating, quick, even strokes and short sails— will mark this species as an Accipiter. Very small size and square instead of round tail will separate it from Cooper's. The lack of red on back and tail is an additional distinction from the pointed-winged Sparrow Hawk.

Nesting. In trees, usually conifers.

Distribution. Nests in most of the wooded sections of Canada except in the more southern parts, north to the tree limit. A common migrant nearly everywhere.

This is the smallest Hawk we have. It has not the sustained strength or persistency of the "Noble Falcons", but it is active and agile. It makes bold dashes at its prey, but on missing the stroke seldom follows it up by pursuit and almost never strikes on the wing, as they do.

Economic Status. This is the species that should have been called "American Sparrow Hawk" instead of the little Falcon which has been so named. It is a close relative, and the American representative of the European Sparrow Hawk which is also an *Accipiter.* The name would suit this bird excellently as the smaller Sparrows and other birds are its favourite food.

Of 107 stomachs examined, 6 contained poultry or game-birds; 99, other birds; 6, mice; and 5, insects. This gives 105 harmful food items against 11 good ones. The mice consisted of no more than 9 individuals, but the small birds numbered 115, from Kinglets to a Mourning Dove in size. This makes a strong case against this otherwise rather interesting species. One good word can be said for this little Hawk; it is fond of the English Sparrows and takes toll of their flocks about the smaller towns and cities.

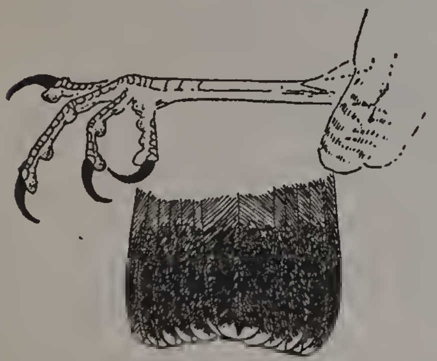


Figure 208
Specific details of Sharp-shinned Hawk; scale, ½.

333. **Cooper's Hawk.** CHICKEN HAWK. *Accipiter cooperi.* L, 15·50. A rather small Hawk, between the Sharp-shinned and Goshawk in size (Figure 202—4). Almost exactly similar in colour and plumage sequence to the Sharp-shinned Hawk (*See* Plate XXV A and description of that species) but larger.

Distinctions. Easily separated from the smaller Falcons, the Sparrow Hawk, and the Pigeon Hawk, by its accipitrine characters of round wing and untoothed bill (Figures 205 and 206, compare with 228 and 229). Most likely to be confused with the Sharp-shinned or Broad-winged Hawks. Usually separated from the Sharp-shinned by larger size; but a small male may measure closely to the size of a large female of that species. A bird over 16 inches will be this species; under 14, a Sharp-shinned. The tarsus of Cooper's Hawk is heavier and the tail is rounded instead of being square or slightly forked when closed (Figure 209, compare with 208).

Occasional very large females may approach a small Goshawk in size. A bird 19 inches or under will be a Cooper's Hawk. In no plumage does it resemble the adult Goshawk, but juveniles of the two species have a very similar coloration. The best distinction other than size is the feathering of the leg. In Cooper's Hawk, less than one-half of the tarsus is feathered, in the Goshawk, one-half or over (Compare Figures 209 and 211). The Cooper's Hawk is also similar in size and colour to the Broad-winged Hawk. The latter, however, is a *Buteo* and not an *Accipiter*, with a deeper wing and a chunkier build. The best colour distinction, however, is the under-wing surface. In Cooper's Hawk it is sharply and regularly barred to the primary tips, in the Broad-winged it is mostly creamy white with but suggestions of bars. In Cooper's Hawk the first five primaries are emarginate, in the Broad-winged but three (Compare Figures 209 and 215).

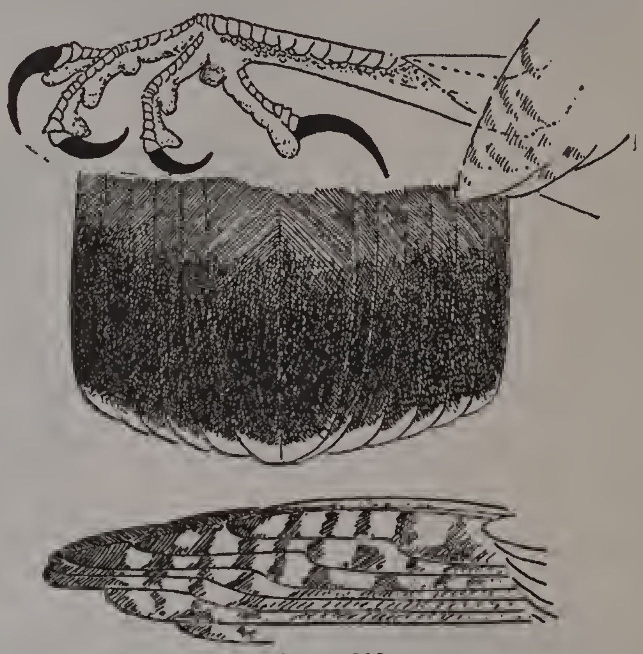


Figure 209
Specific details of Cooper's Hawk;
foot and tail; scale, ⅓;
wing tip; scale, ¼.

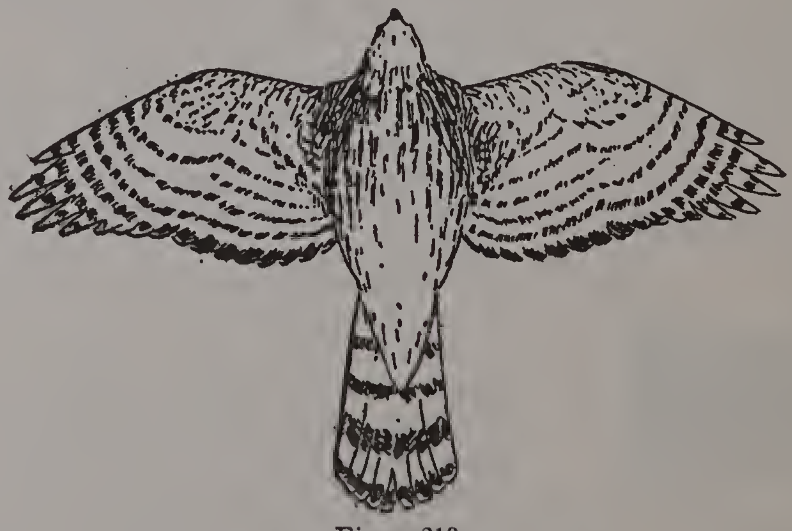


Figure 210
Cooper's Hawk (juvenile); scale, ⅛.
Appearance in flight.

Field Marks. A small Hawk between the Sharp-shinned and Broad-winged in size (Figure 202—4). Short, round wings regularly barred below, long tail (Figure 210), and flight—when not under a burst of speed, a series of quick even strokes and short sails—

will mark this species as an Accipiter. Small size will separate from comparable plumaged Goshawks and the round instead of square tail from the Sharp-shinned.

Nesting. In trees, much like the Sharp-shinned but seldom in conifers.

Distribution. Breeds in most of the southern wooded sections of Canada, south over the United States.

An even more harmful species than the Sharp-shinned, as its larger size gives it greater power and capacity for damage. Showing an almost equal spirit it seeks larger prey and even a fairly well-grown chicken is not safe from it. Adult fowls are rarely attacked unless feeble.

Economic Status. Of 94 stomachs examined, 34 contained poultry or game-birds; 52, other birds; 11, mammals; 1, frog; 3, lizards; and 2, insects. The mammals consisted of rodents, mostly harmful, but one a grey squirrel; making a total of 87 food items against the species, 12 in its favour, and 4 neutral. As it is a comparatively common Hawk throughout much of the settled parts of the country, it is certainly a menace and is responsible for much of the popular ill-repute of the order as a whole.

334. **American Goshawk** (Including **Western Goshawk**). BLUE PARTRIDGE HAWK. HEN HAWK. *Astur atricapillus.* L, 22. Plate XXV B. A large Hawk, only smaller than the big Buteos (Figure 202—3), striped brown and white when juvenile like several other species, but, when adult, uniform, light grey, almost all over, finely vermiculated with darker below.

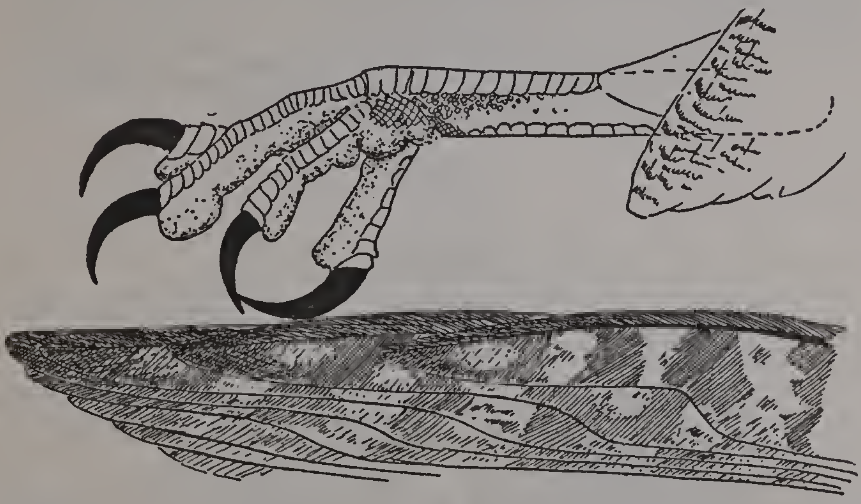


Figure 211
Specific details of Goshawk; scale, ½.

Distinctions. The adult is, by its distinctive grey colour, unmistakable. The juvenile resembles a number of other species, from all of which, except its next relative, the Cooper's Hawk, it can be separated by its five emarginate primaries, regularly, though sometimes faintly, barred below to the tips (Figures 211, 212). From the Cooper's Hawk, that approaches it in size, by the feathering of the leg which extends one-half or more of the length of the tarsus (Compare Figures 211 and 209). However, an Accipiter over 19 inches long will almost certainly be this species. The Goshawk also often has the whites of the underparts tinged with buffy, which never occurs with the Cooper's Hawk.

Field Marks. The largest of the Accipiters, next smaller to the large Buteos, the Red-tail, and Swainson's Hawk (Figure 202—3). Rounded wings, regularly barred below, and long tail as an Accipiter (Figure 212). Large size and, when adult, general grey colour as a Goshawk.

Nesting. In trees.

Distribution. Breeds in the northern wooded sections across the continent. Sometimes in winter it comes down into the prairie and southern sections in considerable numbers.

SUBSPECIES. The type form, the Eastern Goshawk *Astur atricapillus atricapillus*, is the common subspecies over the greatest part of its range. Some migrants into southern British Columbia and southward are considerably darker, more overwashed with buffy in the juvenile, and blacker on back and breast when adult, and have been separated as the Western Goshawk *Astur atricapillus striatulus*. We know very little of the geographic distribution of this form, but presume that it breeds somewhere on the northwest coast. The fine vermiculation of the underparts usually given as the distinctive character of this race is but an indication of full maturity.

The American representative of the Old World Goshawk or "Goose Hawk", which seems to have been the original name, was the only Short-winged Hawk regularly used in ancient falconry. It was flown at hares, partridges, and such ground-game, which its long tail and short wings allowed it to follow through rapid turnings and twistings, whereas its size allowed it to kill quite large game. It was not, however, regarded as a thoroughly sportsmanlike bird as it lacked the spirit and energy of the Long-winged Falcons and its use lacked the excitement and interest aroused by the use of "Noble Hawks."

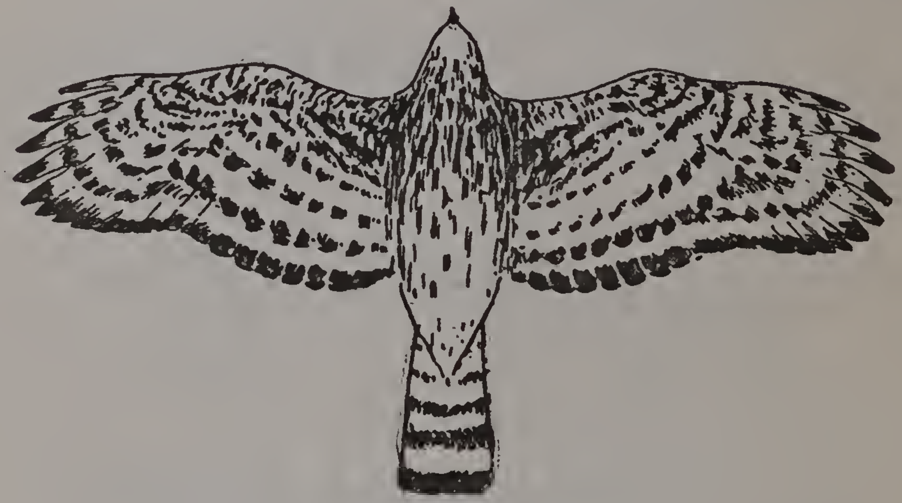


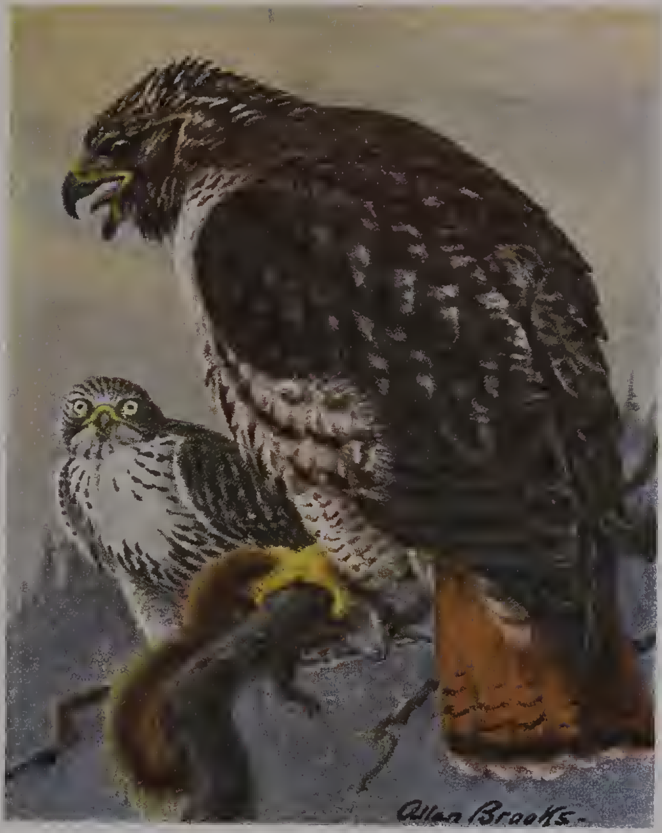
Figure 212

Goshawk (juvenile); scale, $\frac{1}{12}$.

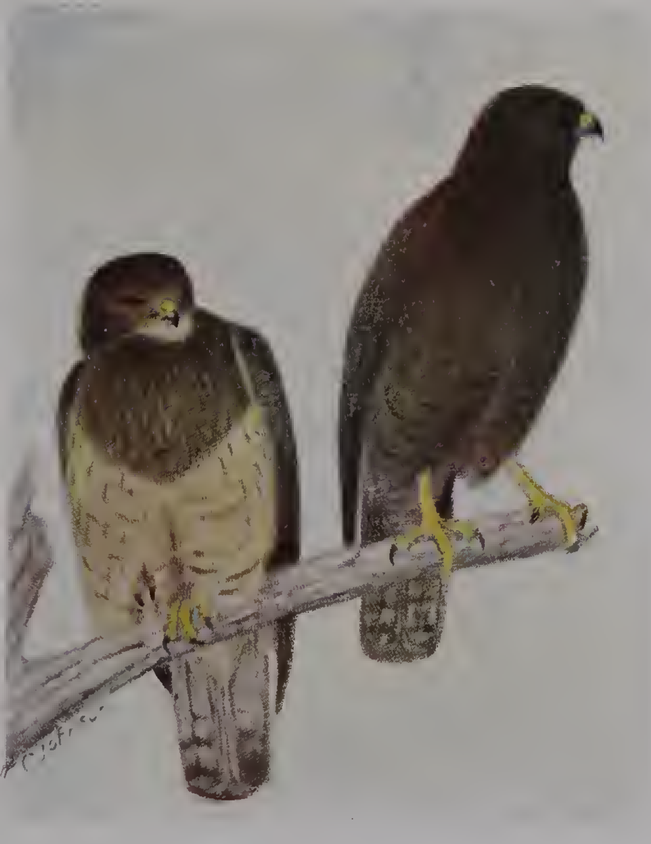
Appearance in flight.

Economic Status. Fortunately this bird is only an irregular winter visitor to our most thickly settled sections. Otherwise it would be a serious menace to the poultryman. Of 20 stomachs examined, 9 contained poultry or game; 2, other birds; 10, mammals; 3, insects; and 1, a centipede. Of the 10 mammals, 3 were rabbits and 1 a grey squirrel, both of which can be regarded as useful. This gives a total of 15 harmful food items against 9 useful and 1 neutral. There can be no question as to the harmful status of this species. Its size gives it ample power to take pullets and even well-grown hens, and such large game as Ruffed Grouse is its favourite food. Though the real home of the Goshawks is in the more northern forests, once they establish themselves near a farmyard they are likely to visit it daily. They dash suddenly over or around a building into the middle of the poultry flock, seize their victim, and are off with it before the owner can protect his property.

Plate XXVI



A. Red-tailed Hawk; scale, $\frac{1}{6}$
(Western Red-tail, most common phase)
Juvenile Adult



B. Swainson's Hawk; scale, $\frac{1}{7}$
A common light phase Dark phase

TRUE BUZZARDS

Heavily built Hawks of medium or very large size (Figures 201–4, and 202–5 and 7). Bill without notches or tooth-like projections (like Figure 206, compare with 229). The wings are round like the Accipiters (Figure 205), but broader. The tail is long, full, and generally carried spread out in a broad semicircle (Figures 214, 216, 217). The first three or four primaries are emarginate (Figures 213, 215), and with the exception of the Red-shouldered Hawk, which is very rare or entirely absent in western Canada, they are usually solidly coloured, with little barring and more or less of a white area at their bases underneath. Most western representatives of this group show remarkable dichromatism, one extreme of which is very dark brown, almost black, and substantially alike in all species affected. The Genus *Buteo* has bare tarsi (like Figure 211), but *Archibuteo* is feathered to the base of the toes (Figure 219).

Field Marks. Round, broad wings; broad, full tail (Figures 201–4 and 202–5 and 7), and habits of soaring high in the open make the best field marks for the Buzzards.

These are the true Buzzards. The Turkey Vulture is incorrectly called "Buzzard" in the south. Buzzards lack the dash, speed, and spirit of either the Accipiters or the Falcons and specialize on less active game. They often feed on insects and occasionally on carrion. They are the common high-flying Hawks of summer, can be seen circling high in the air or perched sentinel-like on fence or telegraph pole, scanning the open landscape. They are birds of the open, as the Accipiters are of the brush, and are not given to quick dashes through the shrubbery like their agile relatives. They are the Hawks that build the great bulky nests in the larger trees of the prairie bluffs, in the coulées, or on the ground on steep hillsides.

Economic Status. As a class the Buzzards are the most useful as well as the largest of our Hawks. Some of the largest of them have scarcely a black mark against them. They live throughout the summer almost entirely on rodents. Although there is a slight reservation in the approval with which the Red-tailed Hawk is regarded in the east, there is no doubt as to its usefulness throughout the prairie region, as it is amongst the foremost of gopher destroyers. Wherever rodent vermin is a detrimental agricultural factor, this group of Hawks may be regarded as valuable allies of the farmer. Its members have a marked preference for furred, over feathered, food, and their large size and capacity ensure that their activities are on sufficient scale to be of value.

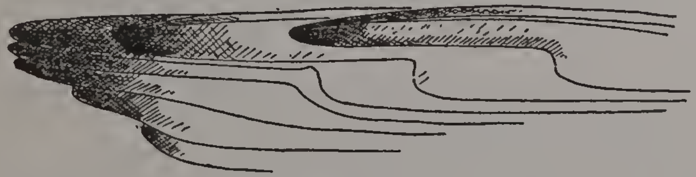


Figure 213
Four notched primaries of Red-tailed Hawk; scale, ½.

337. **Red-tailed Hawk** (Including **Western, Krider's, Harlan's,** and **Alaska Red-tailed Hawks**). HEN HAWK. *Buteo borealis.* L, 20. Plate XXVI A. One of our two largest Buzzards. Characteristic adults have brick-red tails, but western birds are so variable that this or any colour character make uncertain criterion for identification. Though in the east the Red-tailed is practically constant in coloration, its only marked variation being two age-plumages, in the west the case is quite different. The western bird not only shows the same two age-plumages, but also appears in two distinct colorations, one of which is solidly near-black, with many intermediates between it and a much whiter opposite extreme, thus making an almost infinite number of colour variations. As three other species of comparable size show a similar dichromatism and are inseparable from the Red-tailed by colour in the dark phase, the difficulty in distinguishing the species is great. Fortunately there are other characters besides colour to assist in identification.

The Red-tail plumage that is most common in western Canada is hardly distinguishable from the eastern bird. The juvenile above is solidly dark brown, almost black, from crown to tail inclusive, the latter being barred regularly with still darker shades. All below is white, with sides of breast, flanks, and a broken area on upper abdomen striped with dark. Some intermixture of white or cream can be expected on crown and back. The adult of this juvenile is, in general, similar, but redder above, more creamy below, with less and ruddier streaking and almost immaculate pantaloons. The tail is an even brick red with more or less of a narrow, black, subterminal band and a faint, faded, or creamy tip. Many western birds differ from this type only by irregular mixtures of red in the tail of the juvenile, more heavily barred thighs or pantaloons, and the addition of more or less complete dark bars across the red tail of the adult.

The extreme dark phase is almost entirely dark brown, nearly black (like the dark Swainson's Hawk, Plate XXVI B) with a dark-barred, grey-mottled, or red tail that may be either barred or not. Between these two phases is every possible intergradation and some very peculiar piebald mixtures occur. On the other hand, some specimens run to an extreme of whiteness that approaches albinism.

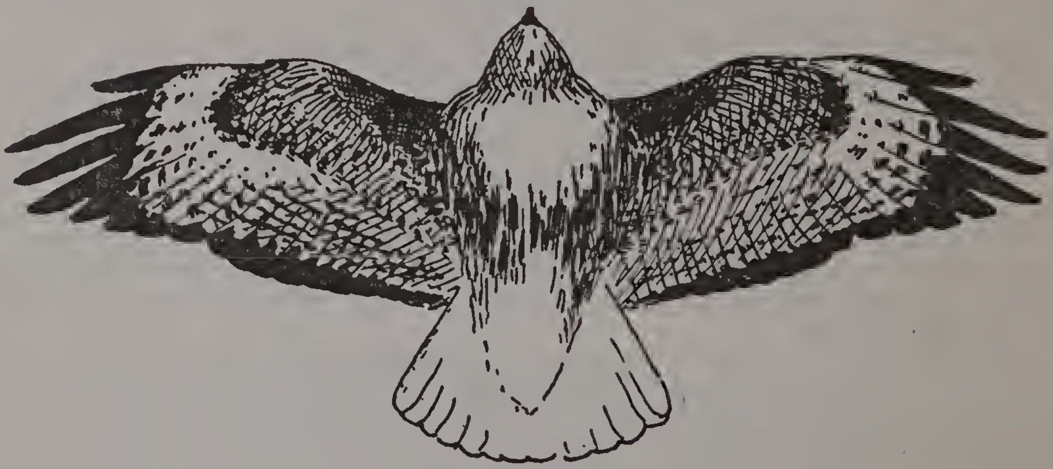


Figure 214

Red-tailed Hawk; scale, $\frac{1}{12}$.

Appearance in flight.

There may be large amounts of white or cream mixed with the dark of the back, and the head may be largely white. The tail may be cream to white, with or without dark barring. These differences, not due to sex, age, or season, have suggested the division of the species into numerous subspecies, but the more the species is examined the less claim do these irregular variants seem to have to special treatment, any more than do those of Swainson's Hawk and the Roughlegs that show similar variants but are not subspecifically divided on that basis.

Distinctions. Size will separate the Red-tailed Hawk from all Hawks except Swainson's and the two Rough-legged Hawks. The bare instead of feathered tarsus will easily distinguish it from the latter two (like Figure 211 instead of Figure 219). The birds average larger than Swainson's, but there is considerable variation in size and they are best distinguished from it by wing characters. In the Red-tailed the first four instead of the first three primaries are sharply emarginate and the third, fourth, and fifth are about equal in length, but longer than the rest, and thus form the point of the wing (Figure 213). Though both species are so variable in colour that some plumages are difficult or impossible to separate on that basis, there are certain distinctions that can usually be observed. In the Red-tailed the dark areas aggregate across the abdomen instead of across the breast, leaving the upper the lightest part of the front. In Swainson's the converse is the case, the lightest spot being below the breast. This distinction is less pronounced in light juveniles and, of course, is absent in the extreme solidly black phase. Small juvenile Red-tails may be confused with the Red-shouldered Hawk, but that species is rare or absent in western Canada.

Field Marks. A large Buzzard, practically the same size as the Rough-leg and Swainson's, only noticeably inferior to the Osprey and the Eagles (Figure 202–5). Wings round and broad. Of wide range in colour, from near-black and white, with or without varying amounts of cream and reddish, to solid and complete dark brown, almost black. A reddish tail when present is always determinative of this species. Separated from Swainson's Hawk by slightly rounder, less-pointed wing tips, and by the breast being lighter instead of darker than the abdomen. From the two Rough-legged Hawks, the Red-tailed is separated with greater ease as a rule. It is never as evenly dull ochre on the breast, nor has it the decided, sharply defined black abdominal band of the characteristic American Rough-legged (Figure 217). It is rarely as solidly white below, nor are the pantaloons in so deep rufous contrast as is usual in the Ferruginous. The tail, except in the *Krideri* phase (*See* following), is not as white, and even in that form it never whitens towards the base, nor are there white spots on either side of the rump. Another point of distinction is that although the inner webs of the primaries lighten towards their bases, they do not separate in any normal flight attitude to show a flash of white from above as they do in the Rough-leg even in the blackest phase (Figure 220).

Nesting. In bulky nests in tree tops.

Distribution. Across the continent as far north as the tree limit. More common in breeding season in the wooded than in the prairie sections, but common throughout the latter in migration.

SUBSPECIES. The Red-tailed Hawk has been divided into several races. The Eastern Red-tail *Buteo borealis borealis* extends westward through Ontario; but, beginning with the prairie sections in Manitoba, it intergrades, intermixes, and interbreeds so thoroughly with the Western Red-tail *Buteo borealis calurus* that there is great difficulty in defining the distinctive characters or saying where one begins and the other leaves off. Almost typical eastern birds can be found westward to the mountains and the most common plumage of the prairie is only slightly different from that of the eastern birds. Mixed with, and even mated to these indeterminate birds, are those of unmistakable *calurus* character—larger amounts of black below, the dark tail of the juvenile more or less mixed with red, and the red tail of the adult more or less barred with dark. Strangely, the particular type of coloration upon which the name *B.b. calurus* is founded, a black-phased bird with a black-barred red tail, although common farther south, has not as yet been detected in Canada. In British Columbia a redder type occurs. It is a heavily coloured plumage, with a reddish tendency across the breast. This coloration is not often seen on our prairies.

Besides these two forms, *borealis* and *calurus*, there are two others recognized by the Check-list that present peculiar problems to the Canadian ornithologist—Krider's Hawk *Buteo borealis krideri* and Harlan's Hawk *Buteo borealis harlani*. These are so variable that it is difficult to say just what are their distinguishing characters or whether after all they are not respectively just the light and dark extremes of the Western Red-tail.

Krider's Hawk *Buteo borealis krideri* is like a whitened *Buteo borealis* with much white on head, tail, and intermixed on the back. The tail of the adult may be pale red, cream colour, or even pure white, and may be sharply barred or nearly immaculate. This form is not common anywhere, but is most numerous from Iowa to Manitoba and occurs irregularly west to the mountains. Birds of *krideri* appearance occur sporadically throughout the west, north even to the Yukon.

Harlan's Hawk *Buteo borealis harlani* on the contrary was originally based on a black Red-tail that had a considerable admixture of grey mottling and a black tail with a slight yellow tip. Whether these are essential characters of a distinct subspecies or only individual colour variations to a highly variable single race is not clear, but *harlani* tendencies occur in some specimens of otherwise pure *calurus* type. Birds with dark tails mottled or marbled with greyish or reddish, are usually referred to this race, but some authorities refer any dark-phased Red-tail with black tail to *harlani*, and there is lack of unanimity as to the essential characters of the race.

Owing to the uncertainty of the subspecific characters, lack of definite geographic range, and to regular interbreeding with *calurus* or *borealis* the writer is inclined to discard both *krideri* and *harlani* as separable subspecies and to regard them as the light and dark extremes of *calurus* whose most distinctive character from *borealis* is great variability.

Another rather slightly characterized subspecies, the Alaska Red-tailed *Buteo borealis alascensis*, has been described from southeastern Alaska and may occur in British Columbia. It is a small *calurus*, but with dark areas a blacker brown. It is not known whether it is double phased.

Economic Status. Nearly everything said of Swainson's and the Rough-legged Hawks (which see) applies to this bird. Its record is not quite so satisfactory, but it is almost captious to raise objections. It is a hardy bird, and may remain with us later in the season than the others; often a few linger after the gophers have holed up for the winter. Then, of necessity, it must turn to other prey, and for a short season may give some offence to the poulterer or the game protectionist, for it is powerful if not very agile, and has been known to kill birds as large and vigorous as Ravens. Depredations are usually committed by young and inexperienced birds in search of easy prey, but the fact that the species has already spent months industriously hunting ground-squirrels and gophers and will do so another season if spared, should more than counterbalance any injuries it may inflict in the meanwhile. Where rodents are a serious economic problem, the Red-tailed Hawk is too valuable to be destroyed except under severe provocation.

Hypothetical:

339. **Red-shouldered Hawk** (Including **Red-bellied Hawk**). *Buteo lineatus.* L, 18·30. Smaller than the Red-tailed or Swainson's Hawks, but larger than the Broad-winged. The juvenile is coloured much like the young light phases of those birds. Adults are solidly light tawny-rufous below, more or less softly barred with lighter, and lined with fine, dark, shaft streaks. Tail and wings are barred with dark and light, decidedly so in the adult, less in the juvenile.

Distinctions. Separated from all comparable Hawks except the Red-tailed by having four instead of three first primaries emarginate (like Figure 213). In nearly all plumages, the shoulders or lesser wing coverts are strongly rusty.

Field Marks. Too rare in western Canada and too like other species to be accurately identified by sight.

Distribution. Eastern North America, north to the spruce forest. West to western Ontario. Also the Californian coast. Its presence in Manitoba has been suspected but never demonstrated. Sight records of its occurrence on the southern British Columbian coast have been reported, but are withdrawn by the observer and may be disregarded. It should be looked for carefully, especially in Manitoba, but identified with caution.

SUBSPECIES. The eastern and California members of this species, though entirely isolated from each other, are yet listed as subspecies of a single species. The western form, known as the Red-bellied Hawk *Buteo lineatus elegans,* differs from the Eastern Red-shouldered *Buteo lineatus lineatus* in being considerably richer and brighter in colour and seems to have different habits and bearing. It is described as being owl-like in flight, which cannot be said of the eastern bird, and the two forms may yet prove to be specifically distinct.

342. **Swainson's Hawk.** *Buteo swainsoni.* L, 20. Plate XXVI B. Nearly equa in size to the Red-tail. Although it has a light and dark phase and shows an equally bewildering variety of coloration it never has a red tail. A common juvenile plumage is very similar to many young Red-tailed; above, dark brown; below, white slightly tinged with buff, and variably striped with dark on flanks and across breast. Perhaps the most characteristic adult coloration shows mostly light below, whitest on throat, with a broken, or continuous darker band of some shade of brown across the breast. The black phase, when complete, is uniform dark brown (*See* Plate XXVI B) similar to the corresponding plumages of the Red-tailed and the Rough-legged.

Distinctions. Separated from the Rough-Legged by the bare instead of feathered tarsi (like Figure 211, instead of 219). Distinguished from the Red-tailed by slightly smaller average size and by having three instead of four first primaries emarginate, and the third and fourth (not the fifth) equal and longest, forming the tip of the wing and making the wing slightly more pointed than that of the Red-tailed (compare Figures 215 and 213).

Though both species are so variable in colour that some plumages are difficult to separate on that ground, there are certain distinctions that can usually be observed. In the Swainson's Hawk the dark markings are concentrated or aggregated across the breast instead of across the abdomen, leaving the latter the lightest part of the undersurface (compare Figures 216 and 214). In the Red-tailed the converse is the rule. This distinction is less pronounced in juveniles and, of course, is entirely absent in the extreme solid black phase.

Small juveniles can be distinguished from the Red-shouldered Hawks by their having three instead of four emarginate primaries.

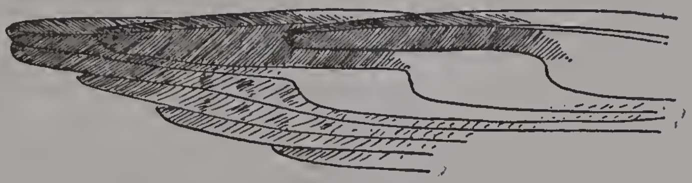


Figure 215
Three notched primaries of Swainson's Hawk; scale, ½.

Swainson's Hawk is much larger than the Broad-winged and the emargination of the primaries will separate it from the larger Accipiters, such as the juvenile Goshawk which has five feathers emarginated (Compare Figures 215 with 211).

Field Marks. A large Buzzard Hawk with wings slightly more pointed than the Red-tailed (Figure 216). Wide range in colour, from near-black and white with varying amounts of cream, dull ochre, and reddish to solid and complete near-black. Usually with more or less of a darker breast-band making the abdomen the lightest part of the under surface. It is rarely as extensively white below as the lightest of the Ferruginous Rough-leg, nor are the pantaloons as deeply rufous. The tail is never markedly white nor red and is usually somewhat regularly barred. Another point of distinction from the Rough-legged Hawk is that the base of the inner webs of the primaries do not lighten enough to show white on the upper surface of the wing in any normal flight attitude (*See* Figure 220).

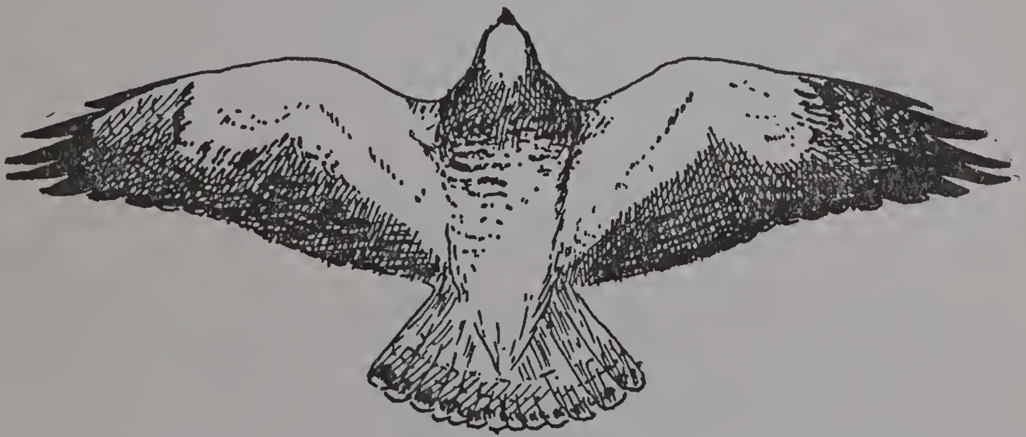


Figure 216
Swainson's Hawk; scale, $\frac{1}{17}$.
Appearance in flight of most characteristic plumage.

Nesting. A bulky nest of sticks in trees.

Distribution. Western North America. In Canada, from Manitoba westward to the coast, north to the tree limit. Most common on the prairies. Migrates to South America. It is our only Hawk that regularly retires entirely from the North American continent in winter.

Swainson's is the common Hawk of the prairies. Nearly all the larger bluffs and most of the wooded coulées contain one or more of their nests from which they beat out over the cultivated and waste places carrying destruction into the ranks of ground squirrels and gophers. Though the

Red-tailed Hawk may take an occasional chicken or Grouse, instances of Swainson's Hawk doing so are unusual enough to cause surprise. It varies its rodent food with grasshoppers it catches on the ground with clumsy gravity, making heavy hops with waving wings and short runs hither and thither as it grabs the nimble insects with talons that look absurdly big and formidable for the purpose. Though its effects on insects are not to be disregarded, its highest usefulness is obviously directed against small mammal pests. Early and late it is at work supplying its own needs and those of its hungry offspring, and the total number of gophers consumed by a single family of this Hawk throughout the season reaches an important total. The prairie farmer can scarcely raise better paying stock than a few broods of Swainson's Hawks. The value of this system of gopher control is that it is always working and is not confined to the premises that are kept clear of vermin by dint of owners' efforts, but is spread over those of his more careless neighbour whose land is a constant source of reinfestation to surrounding localities.

343. **Broad-winged Hawk.** *Buteo platypterus.* L, 15·89. The smallest of the Buteos. Similar in size to Cooper's Hawk (Figure 202-7). Juvenile, dark brown above; white below, striped on sides of breast, flanks, and abdomen with dark. Much like a small, juvenile Red-tailed of the eastern or light type. Adult, above, dark, without any bluish tinge. Tail, dark, with two to three conspicuous light bars across. Below, dull rufous brown irregularly barred with white, the reddish more uniform towards the breast. Occasional melanotic or black specimens occur but are exceptional, and do not form a regular phase of the species.

Distinctions. Very much smaller than any other Buteo. Likely to be confused only with Cooper's Hawk, but has three outer primaries emarginate (like Figure 215), instead of five as in Cooper's, and the other Accipiters (Figures 209 and 211). In spite of its reddish-barred underparts, the adult is easily known from the adult Accipiters, by having no shade of bluish on the back, and the two to three prominent light tail bars considerably narrower than the intervening dark spaces and very pale brown without any greyish suggestion.

Field Marks. A small Hawk, somewhat larger than Cooper's, but of evident Buteo outline (Figure 202-7). Its call, a fine, long drawn-out squeak, like that of a rusty hinge, is very characteristic.

Nesting. In trees in the woods.

Distribution. Eastern North America. In Canada, westward throughout the northern wooded sections of the Prairie Provinces, north to about latitude 55, but only a migrant on the prairies.

Economic Status. This is a bird of the open forest and bush-lands, but is hardly numerous enough in western Canada except, perhaps, in the wooded parts of Manitoba, to have economic importance.

Of 57 stomachs examined, 2 contained small birds; 15, mice; 13, other mammals; 11, reptiles, 13, batrachians (frogs, etc.); 30, insects; 2, earthworms; 4, crawfish. Without further analysis this evidence is sufficient to free this species from any stigma of being harmful.

Rough-legs

The Rough-legged Hawks are Buzzards principally characterized by having legs feathered to the base of the toes (Figure 219). They are Hawks of the very largest size, but their feet are comparatively small and weak for so large a bird, and they are obviously too lightly armed for attack on vigorous prey. They restrict their diet to small mammals and insects, being particularly efficient grasshopper destroyers. They obtain their name from the "rough" or feathered tarsus. There are two species of the group in Canada, one nesting commonly in the southern prairies, the other a summer inhabitant of the far north, passing through settled Canada only on migration. Both species are dichromatic and occur in light and dark phases with intermediate plumages.

347. **Rough-legged Hawk** (Including **American Rough-legged Hawk**). *Archibuteo lagopus.* L, 22. One of the largest of our Hawks, slightly smaller than the Ferruginous Rough-leg and comparing in size very closely with the Red-tailed. It occurs in a light and a dark phase, and has intermediate plumages. The commonest coloration (Figure 217), the light phase, probably a juvenile plumage, is brown above, with much blended cream, or rusty ochre feather edgings that become more extensive on head. The base of the tail is cream, changing to dark for final half. Below—cream or dull light ochre, with practically solid and complete dark brown abdominal band, usually sharply defined at upper line. Face, foreneck, and breast more or less striped with brown. The dark phase is solid, near-black like the corresponding plumage of the other Buzzard Hawks (*See* dark plumage, Plate XXVI B). Intermediate plumages have a peculiar speckled appearance of mixed brown or black, without systematic pattern. The only constant character of this plumage is the lightening or whitening of the basal half of the tail.

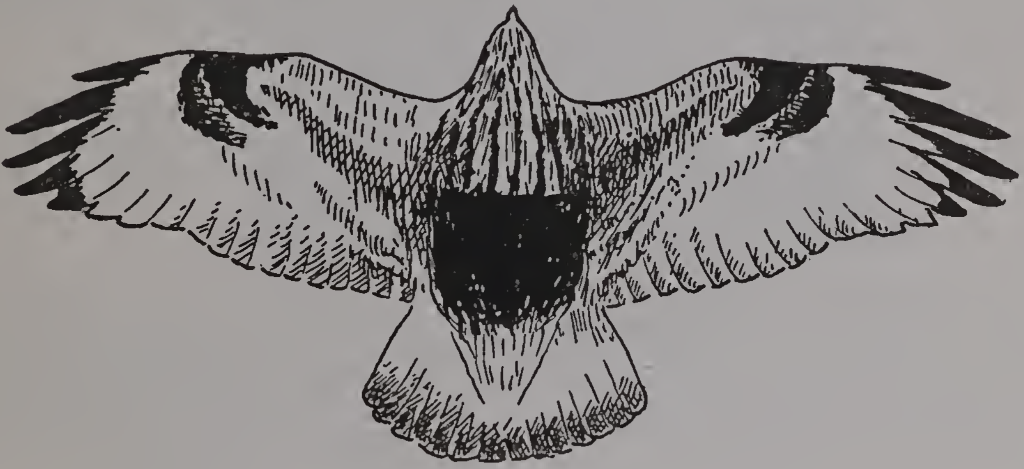


Figure 217
American Rough-legged Hawk; scale, $\frac{1}{12}$.
Appearance in flight of most characteristic plumage.

Distinctions. With its feathered tarsus (like Figure 219), to be confused only with the Ferruginous Rough-leg. In the dark phases the two are absolutely alike in colour, but this species never has the large amount of pure white that the ordinary plumage of that species shows. In the pale phase the ochraceous breast and head and the conspicuous dark abdominal band (Figure 217) are distinctive. In the intermediate plumages, the Ferruginous never seems to have the irregular spotted or speckled mixture of this species. In the complete dark phase, the bill shape that is distinctive in any plumage is probably the best criterion. In this species, looking at the bill from above, it is narrow and constricted towards the gape (Figure 218) instead of being broad and "frog-mouthed" (Figure 221).

Field Marks. Recognizable by its outline and high soaring habits as a Buzzard.

Except in characteristic plumage with extensive dull ochre breast and sharply defined dark abdominal patch, it is difficult to separate it from several similarly appearing hawks. The under surface of the wing usually has a much more pronounced "thumb-mark" of dark near base of primaries than other comparable species, and the tail, white at base and dark at end, shows a much wider, broader, and more pronounced tail band than in any other similar bird (Figure 217). The American Rough-leg has the same light spot at the base of the primaries on the upper surface of the wing, as the Ferruginous (Figure 220).

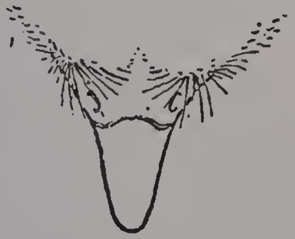


Figure 218
Narrow bill of American Rough-legged Hawk (from above);
natural size.

Nesting. On the ground, on rocky ledges, or in trees.

Distribution. Northern parts of Northern Hemisphere. A bird of the far north. In America nesting on the barren grounds across the continent. Wintering from Oregon and

Minnesota southward. Only a migrant, almost a winter visitor, in cultivated sections of Canada.

SUBSPECIES. The American Rough-leg *Archibuteo lagopus sancti-johannis* is separated from the European Rough-leg by being double instead of single phased, and thus presents an analogous case to that of the Eastern and Western Red-tailed Hawks where the same distinction occurs.

This is an early spring and late autumn visitor to our marshes where it is often seen beating up and down over the sere surface, dropping occasionally into the grass, and then resorting to some nearby fence-post or other little elevation to devour its catch. More commonly, however, it is noted circling in large, loose flocks, so high in the air as to be seen with difficulty, and slowly drifting north or south on its migrations.

Economic Status. Its talons are small and weak for so large a bird, and it confines its attentions to small mammal game. It may sometimes pick up a wounded bird left by the shooters, but occasions of its taking anything of economic value are practically unknown.

Though one of our largest Hawks, it is among the three least harmful. Of 45 stomachs examined, 40 contained mice; 5, other mammals; 1, lizard; 1, empty. A record like this is enough to condemn the indiscriminate killing of Hawks. It is a mouse-hawk *par excellence.* It also feeds on grasshoppers and has been known at times to do most excellent work controlling plagues of these destructive insects.

348. **Ferruginous Rough-leg.** SQUIRREL HAWK. GOPHER HAWK. CHAP-HAWK. *Archibuteo ferrugineus.* L, 24. Plate XXVII A. A characteristic light plumage is shown in the plate. There is also a complete dark brown phase, that is inseparable from the dark Swainson's Hawk, shown in Plate XXVI B. A lighter coloration has the whole underparts, pure, uniform white, very slightly streaked, and the pantaloons or thighs white, or heavily barred with dark rusty in striking contrast with the white abdomen and breast. The whole tail may be white, but usually darkens slightly towards the tip.

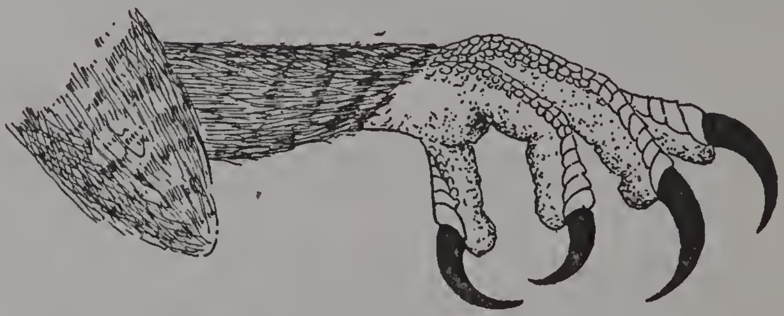
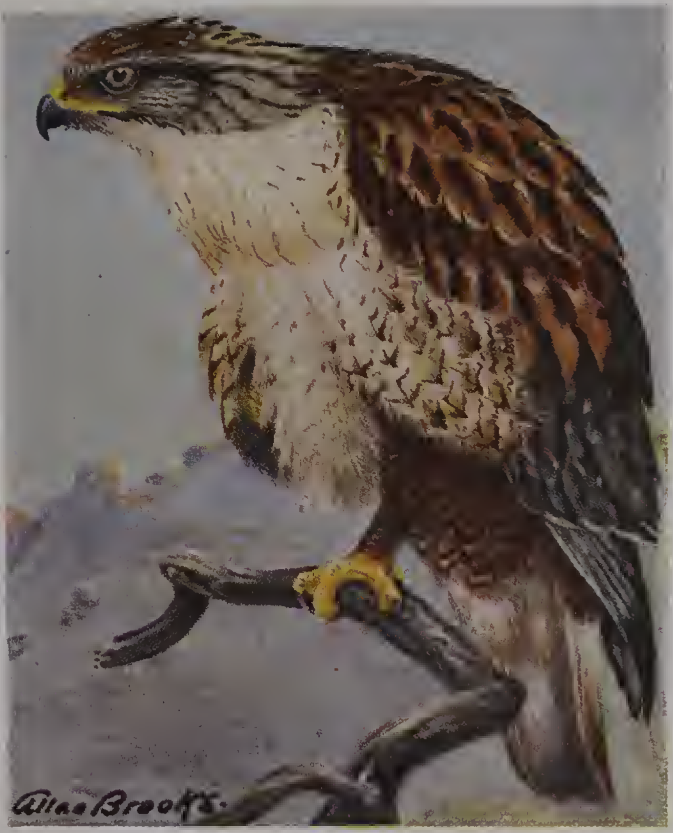


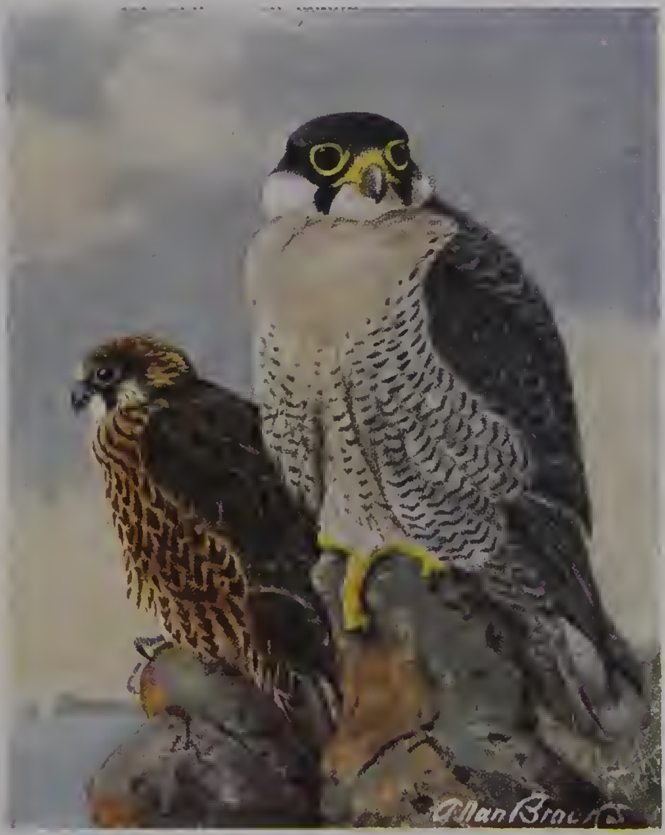
Figure 219
Feathered tarsus of Ferruginous Rough-legged Hawk;
scale, ½.

Distinctions. Easily recognized as a Rough-leg by its feathered tarsi (Figure 219). The breast shows a large amount of pure white which the American Rough-leg never does, and it never has the general ochraceous tone nor the sharply defined dark abdominal band of that species. The tail is white, often gradually darkening towards tip, but never with well-defined dark terminal band. In no plumage has it the patternless intermixture of black and light sometimes seen in the American Rough-leg. The most certain and final distinction, however, between these two species, is the shape of the bill. That of the Ferruginous when examined from above is wide and heavy at the base instead of narrow and constricted, and presents a "frog-mouth" appearance (compare Figures 221 and 218).

Field Marks. A very large Buzzard, the Vulture, Eagle, and Osprey only being larger (Figure 201–4). Separated from the most characteristic American Rough-leg plumage by white breast and abdomen, and absence of dark terminal band to tail. Rough-legs summering within organized provinces are almost certain to be this species, and are likely to be confused only with the Red-tailed or Swainson's Hawks. The ruddy coloration



A. Ferruginous Rough-leg; scale, $\frac{1}{6}$
Most common phase



B. Peregrine Falcon; scale, $\frac{1}{6}$
Juvenile Adult male

of the back, white underparts with little marking, contrasting thighs, and white tail, or tail gradually whitening towards base, make the best distinction from those species. The black phase is very difficult to recognize except by the white bases of the primaries that often show as a flash of white on the upperwing surface when that member is extended to its fullest (Figure 220), a character that is not visible in the normal flight attitudes of the other comparable species except the American Rough-leg.

The typical Ferruginous Rough-leg in flight, seen from below, shows a dark V-mark with apex under the tail, formed by the deeply coloured thighs and tarsi brought together at the closely held feet.

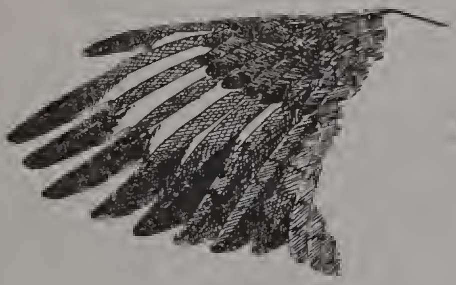


Figure 220

Wing of Ferruginous Rough-legged Hawk (viewed from above, showing white at base of primaries); scale, ⅕.

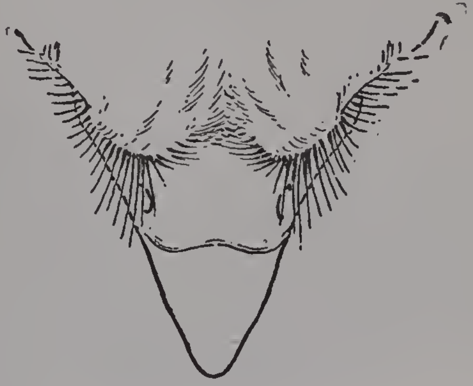


Figure 221

Wide bill of Ferruginous Rough-legged Hawk; natural size.

Distribution. Western North America, a bird of the prairies. In Canada, breeding from western Manitoba to the mountains, north to prairie limits and southward. Not yet satisfactorily identified in British Columbia, though it has been noted in the state of Washington and occurs regularly in California.

The largest but the least harmful and most beneficial of our Hawks. It builds immense, bulky nests in the cottonwoods and poplars in the coulées, on shelves and pinnacles of the bad lands, or even on steep, smooth hillsides. These nests are repaired and added to year after year until they assume enormous proportions. One such was noted on a sloping bank in the Red Deer River bad lands, built to a height of about 10 feet. The base was old, rotten, and compressed, and seemingly of great age; the top was loose, fresh, and in occupation. Some nests are in such easily accessible situations that the wonder is—how they can escape the depredations of the ever-prowling coyote. Perhaps they do not, for though many old nests are encountered in such positions, most of them are small, denoting short occupation, and few are in use at present.

This is a magnificent bird, and should be far more numerous than it is. In out of the way localities it is still common, but it is not particularly wary and disappears more rapidly than other Hawks when its habitat is invaded by settlement. It is to be seen often enough on the great grazing leases, but in agricultural communities, where it is most necessary, it seems doomed to disappear before the ill-judged prejudice against hawks in general.

The Ferruginous Rough-leg is the Ground-squirrel or Gopher Hawk *par excellence*, and well deserves the name. The number of these pests destroyed by them is astonishing. We have no evidence that, through the period of their stay in this country, they ever touch anything but small mammals, and their record is absolutely clear. One nest examined by the writer in the bad lands of Red Deer river contained the fresh remains of several gophers, and in a small hollow immediately under the nest was nearly a bushel of fragments of similar prey, dried bits of furry skin, tails and feet, and such small discards from innumerable meals. The number was not counted, but must have represented several hundred animals, yet they were but the pieces that happened to fall just in this particular direction from the nest. A conservative estimate of the requirements of a family of these large Hawks is surprising in its total. Two adults, from spring arrival to the birth of young, three months, consume not less than a gopher a day, 90 in all. After the young are out, four in the brood, and for two months at least, the family requirement can not average less than three gophers a day, or 180. Thereafter for one month, the six practically adult, though four are still growing, probably will require one gopher each a day, or 180 more. A single gopher, under favourable circumstances, destroys at least one bushel of wheat. Supposing that one-tenth of this can be charged against the average gopher, we still have thirty-five bushels of wheat as the value of this one family of large Hawks for a single season. This can be translated into dollars and cents by multiplying by the current price of wheat, and makes a sum that is well worth considering.

With the reduction of coyotes, foxes, and other natural enemies of Gophers on the prairies, these large Buzzard Hawks, the Red-tail, Swainson's, and Rough-legs, should be encouraged in every way to take their places.

EAGLES

The Eagles are our largest Birds of Prey. Size alone will differentiate them from the Hawks. Any bird of prey over 30 inches long, or 6 feet in extent, is an Eagle. They are typically large Buzzards, and have a similar outline in flight, but with a longer though equally round-tipped wing, and the tail broad but not so long (Figure 201—2). A very distinctive character of the Eagles in life is the shape of the head and bill. The bill is nearly as long as the head itself and shows a particularly massive and characteristic appearance that can be recognized as eagle-like at a considerable distance. We have only two species in Canada.

349. **Golden Eagle.** *Aquila chrysaetos.* L, 30. A large, dark brown Eagle, the hindneck suffused with an ochraceous cast suggesting the name "Golden", and the basal half of tail dark, with indistinct broken bars or speckles of greyish. Tarsus feathered to the base of toes.

Distinctions. In all plumages very similar to the juvenile Bald Eagle, but quite different from the adult. The mature Golden is all black or very dark brown, with hindneck dull ochre. The end of the tail is dark, but beneath the coverts at the base it is obscurely mottled or barred. The juvenile is similar, but the basal half of the tail is largely, or entirely, white. The most distinctive feature for this species, however, is the tarsus; it is feathered to the base (Figure 222) of the toes in all plumages, instead of being bare as in the Bald (*See* Figure 225).

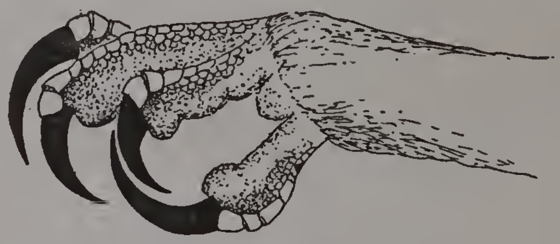


Figure 222
Feathered tarsus of Golden Eagle; scale, ⅓.

Field Marks. Recognizable as an Eagle by its large size; to be confused only with the juvenile Bald Eagle. The juvenile Golden shows as a black bird with a prominent white spot at the base of the primaries, visible on both upper and lower surfaces in flight. The tail is largely white with a broad black border (Figure 223). The adult is all evenly black below (Figure 224). The young Bald Eagle has considerable grey on the underwing surface, becoming more pronounced towards the body, and the tail is either all dark or gradually lightens from the tip without showing a pronounced terminal band. (*See* Figures 226, 227).

Nesting. Nests of sticks on ledges of cliffs, occasionally in trees.

Distribution. Northern part of Northern Hemisphere. In America, across the continent, north to the Arctic ocean, and breeding in Canada irregularly in the more retired localities. More common in the western mountains than elsewhere.

In summer, the Golden Eagle is a bird of the mountains, as the Bald is of the coast and large waters, but it spreads out on the prairies commonly in late autumn and winter. It is a far more spirited and noble bird than the more common Bald Eagle, being a less habitual carrion feeder than that species, and capturing more of its prey by strength and pursuit.

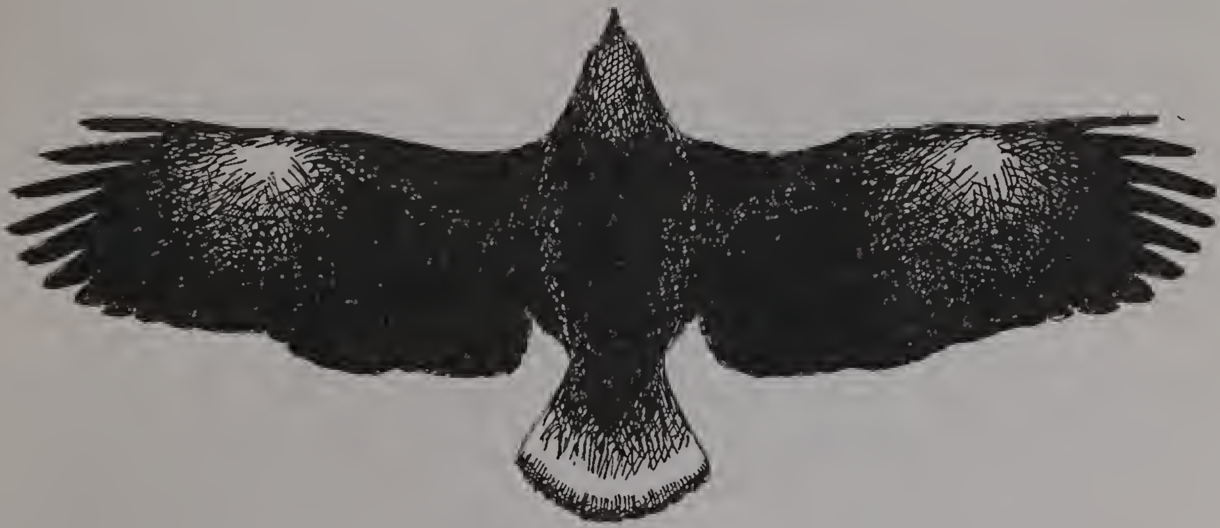


Figure 223
Golden Eagle (juvenile); scale, $\frac{1}{18}$.
Appearance in flight.

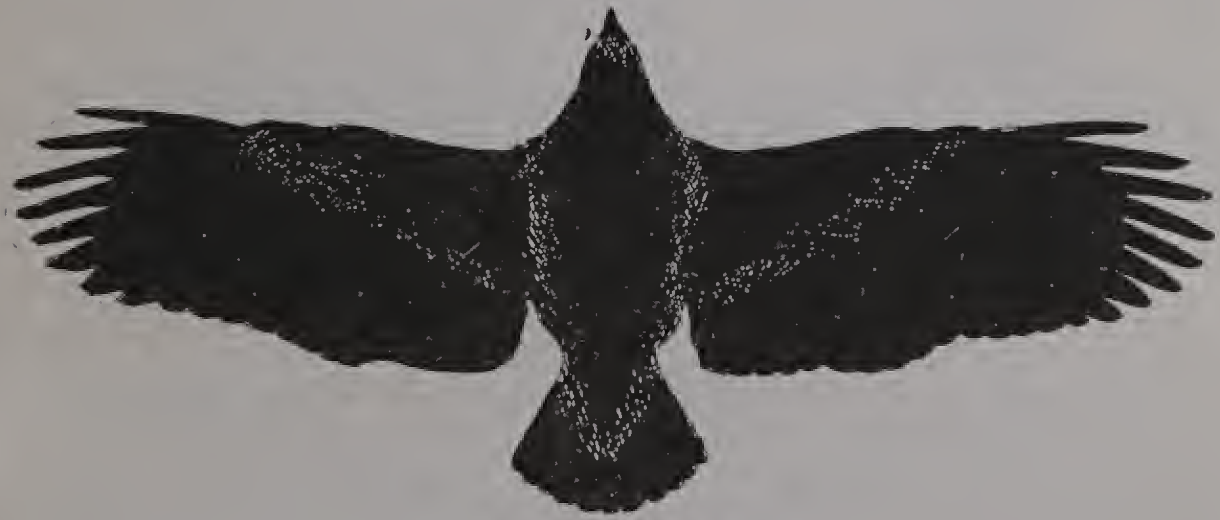


Figure 224
Golden Eagle, (adult); scale, $\frac{1}{18}$.
Appearance in flight.

Except in the mountains of British Columbia, or the prairies in autumn, the Golden Eagle is a rare sight in Canada, and the majority of the popular reports of the species are based on the juvenile Bald Eagle. Its principal food is the big mountain marmot, but many a foolish Blue Grouse, nesting out on the bare mountain shoulders, is picked up by it, and its attacks on the lambs of mountain sheep, or the kids of the mountain goat, are not few or bootless. Probably if the mother is at hand, the bold raider is usually beaten off, but its assault is so sudden and unexpected that often the bleating prey is seized before maternal assistance can prevent. The charge has been made, and with considerable evidence in support, that this bird and the mountain lion are the two serious enemies of these alpine animals. How serious the depredations are remains to be demonstrated, but away from the immediate neighbourhood of high mountains little objection can be taken to the species. Even in the mountains, the damage it does can be easily overestimated, as marmots, rabbits, and gophers are undoubtedly its staple food, the other supplies being probably the result of hoped-for opportunity rather than habitual seeking. On the prairie sloughs it pursues Ducks to some extent, but is a most persistent hunter of jack rabbits. Stories of children having been carried off, or other similar popular tales, are to be largely discounted. Such things may possibly have occurred, but are too extraordinary and the accounts too poorly substantiated to be regarded without suspicion. On the whole, except where special interests and conditions prevail, the Golden Eagle is a harmless and picturesque feature of the landscape.

352. **Bald Eagle** (Including **Northern Bald Eagle**). AMERICAN EAGLE. *Haliaeetus leucocephalus.* L, 33. Adult: a large, dark brown (nearly black) Eagle with white head and tail. Juvenile: all dark brown. Tarsus bare, bright yellow, for half its length (Figure 225).

Distinctions. The adult Bald Eagle, with its conspicuous white head, neck, and tail, is too distinctive to be mistaken. The juvenile is so like the Golden that it has often been confused with it. It never has the golden ochraceous hindneck. The tail lightens towards the base with age, but always gradually, and never shows a definite tail bar as does the young Golden Eagle. The final distinction is the feathering of the tarsus which is bare for half its length instead of being feathered to the base of the toe (Compare with Figure 222).

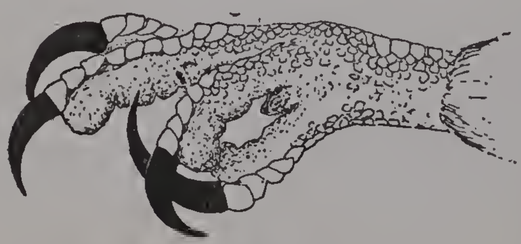


Figure 225
Bare tarsus of Bald Eagle; scale, ⅓.

Field Marks. The adult with white head and tail is unmistakable (Figure 226). The juvenile is very similar to the Golden Eagle. It does not show a white spot at base of the primaries on the spread wing, but the under surface is largely greyish towards the body. The tail may lighten from the tip towards the base, but gradually, and never so as to show a definite terminal bar (Figure 227, compare with Figures 223, 224).

Nesting. Usually in large nests of sticks in tops of tall, isolated trees.

Distribution. North America, from northern tree limit south to Mexico. In Canada, across the continent, more common on the seacoasts than elsewhere.

SUBSPECIES. The Canadian bird is the Northern Bald Eagle *Haliaeetus leucocephalus alascanus*, separable from the southern subspecies by slightly larger size.

Throughout Canada except on the seacoast, the Bald Eagle is nothing more than a rare, interesting, and picturesque feature of the landscape. It is greatly to be regretted that it is usually a target for every gun when it comes within range.

Economic Status. Of 15 stomachs examined, 1 contained game; 5, mammals; 9, fish; and 2, carrion. In examining these data it is observable that the 6 stomachs containing mammals and game are winter specimens and, except one, were taken at a distance from water. Had the natural breeding and summer grounds of the Bald Eagle been the source of the specimens here studied, the mammals and game would probably have been replaced by fish, for this forms the great bulk of its food. The food is taken in various ways. The bird can dive for fish in true Osprey manner when necessary, but it usually picks them up dead from the shore or, where Ospreys are common, takes the fish from them by force. To do this it pursues and badgers the successful fisher until it drops the prize, which by a lightning-like swoop is caught in the air and carried away in triumph. The Bald Eagle is, as a rule, hardly energetic enough to capture the quicker birds, but wounded or hurt Ducks or game are eagerly picked up from the marshes. When opportunity offers the Bald Eagle eats offal without compunction.

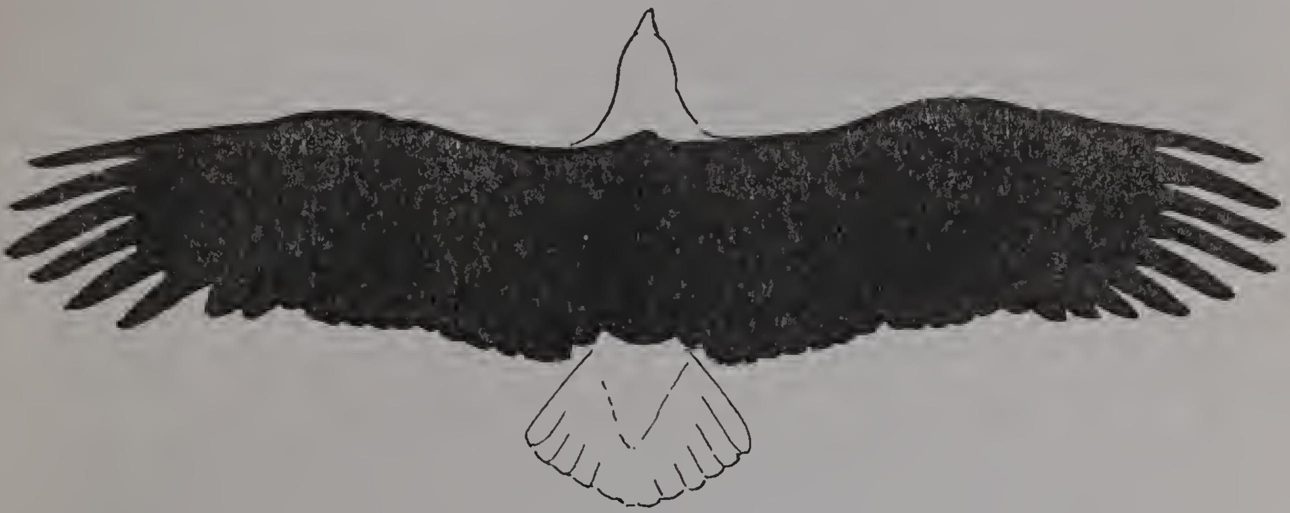


Figure 226
Bald Eagle (adult); scale, $\frac{1}{16}$.
Appearance in flight.

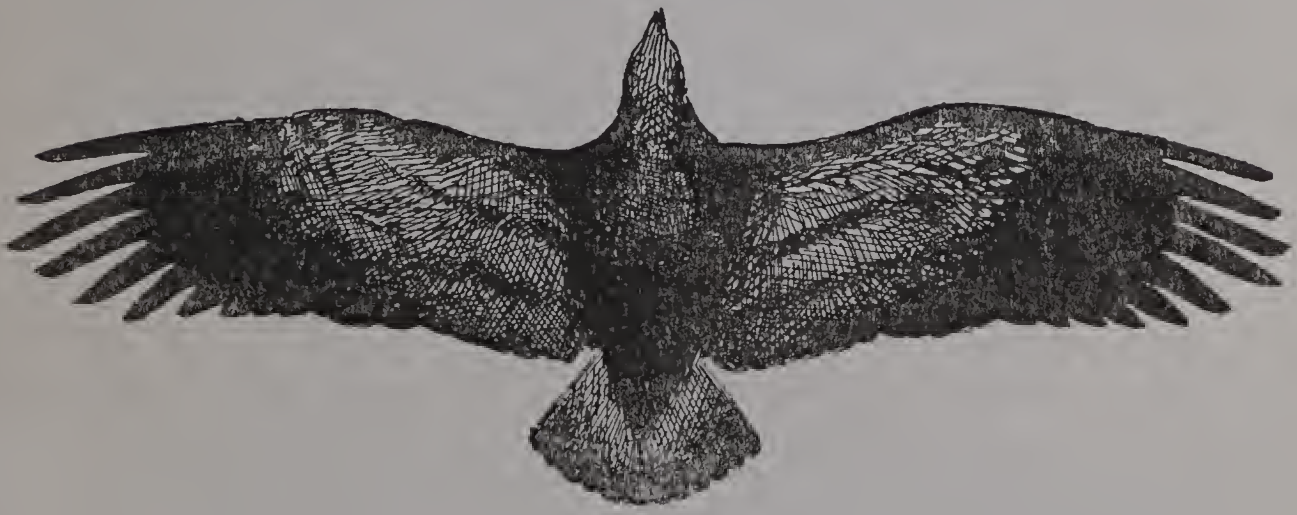


Figure 227
Bald Eagle (juvenile); scale, $\frac{1}{16}$.
Appearance in flight.

On the seacoasts, where unusual numbers of Eagles occur, and different conditions prevail, certain reservations to these conclusions have to be made. The principal food of the Bald Eagle is undoubtedly fish when available, and most of it is waste and offal, but when the salmon are crossing the bars into the mouths of rivers, or making their way up the riffles to spawn, the Eagles attack them energetically. It is not only the fish that are actually killed and eaten that cause uneasiness, but the more numerous ones that tear themselves away from the great talons and die without having accomplished the propagation of their species. These are at times not inconsiderable. When the west coast salmon die after spawning, the Bald Eagles gorge themselves on the stranded bodies, and are too well fed and lazy to attack living game. When this time of abundance is over, however, the Eagles turn to more energetic methods of living, and waterfowl then suffer severely. Once on the wing such birds are comparatively immune from attack, for the Bald Eagle rarely, if ever, attacks from the wing, but, if surprised on the water and cut off from the air, the fate of birds even as large and hardy as Geese and Loons is practically sealed. The fowl dive at the swoop of the enemy, but in the clear coastal waters they cannot hide, and when they come to the surface again for air, there is the pursuing Eagle awaiting them. A gasp is all that is allowed them before another dodge and dive. This goes on for but a few minutes when, exhausted and helpless, the victim is carried off, or towed in triumph to the shore. Where Eagles are only ordinarily numerous, these attacks may be looked upon with equanimity as being of no serious harm to the species affected, but where, as on certain parts of the seacoast, dozens of Eagles may be seen perched on commanding stubs overlooking the bird grounds, their attacks may be serious. At least, their constant harrying keeps the species in question so stirred up and nervous, that they are unable to feed in peace, and linger no longer in the vicinity than is absolutely necessary. That Eagles, even under these conditions, make serious inroads on the multitudes of wild fowl or fish of the coast, is questionable, but that they are always deserving of full protection can also be disputed. Any method designed to keep their numbers more in harmony with human demands should be applied and limited to the localities where they are an adverse economic influence, and where it does not destroy the picturesque features of the interior landscape, that the nature lover cannot well spare.

The relations between the Bald Eagle and the Osprey, and the methods by which the Eagle deprives that industrious and successful fisherman of its catch, are interesting if not admirable, but will be described elsewhere.

Subfamily—Falconinae. True Falcons

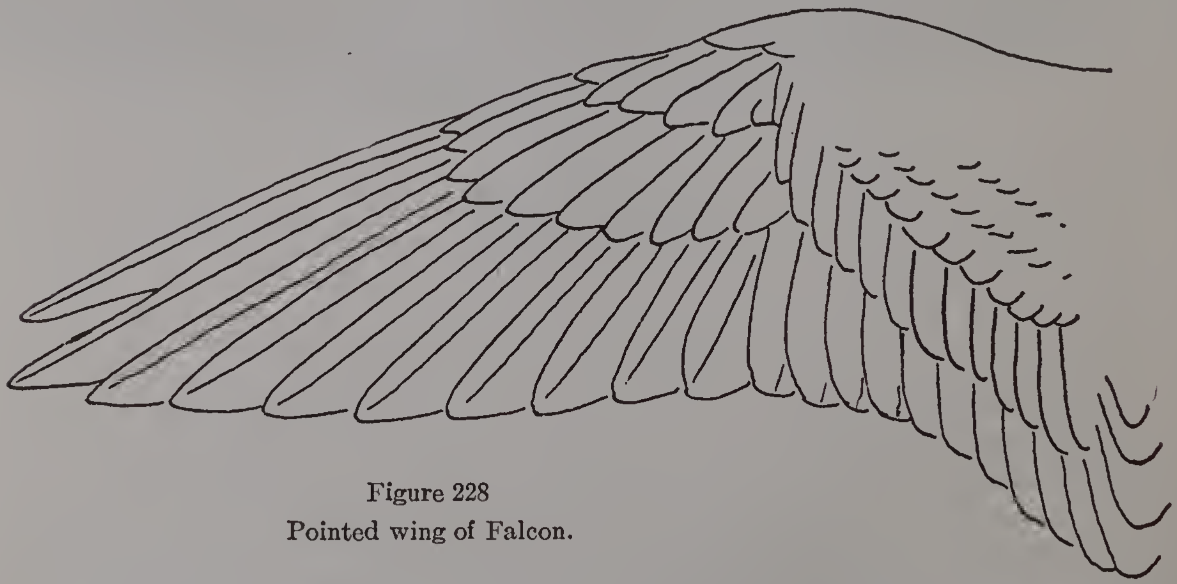


Figure 228
Pointed wing of Falcon.

The Falcons were known to the old falconers as the Noble or Long-winged Hawks and, on account of their great spirit, strength, and address, were the chosen birds for use in hunting. Their long wings give them great speed and their endurance permits them to maintain it. They are bold and strong and capture their prey by sudden swoops when possible, but unlike the *Accipiters* are not discouraged when their stroke misses. They first rise above their prey by means of a long spiral climb. Once above, they drop like a bullet, striking with their powerful talons as they do so.

The flight of the Falcons is quite recognizable—pointed wings (Figure 228) and quick strokes with very little sailing. Seen in the hand, the upper mandible furnished with a tooth (Figure 229) will always separate the Falcons from other Hawks. Fortunately, none but the smallest and least harmful of the subfamily is common within cultivated areas and those that size makes important are either very rare or are more or less confined to the wilder wastes where their depredations can do the husbandman the least harm. Even those that do occur occasionally about cultivation are generally wary enough to keep away from the immediate vicinity of the habitations.

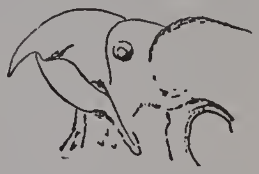


Figure 229
Toothed bill of Falcon.

GYRFALCONS

General Description. The largest of the Falcons, 20 to 22 inches in length; usually of light coloration, in some cases nearly pure white, others almost black. They are most easily distinguished from the other Falcons by their large size, but are otherwise characterized by the tarsus being feathered for one-half its length instead of only one-third, and the first primary being equal to or shorter, instead of equal to or longer, than the third.

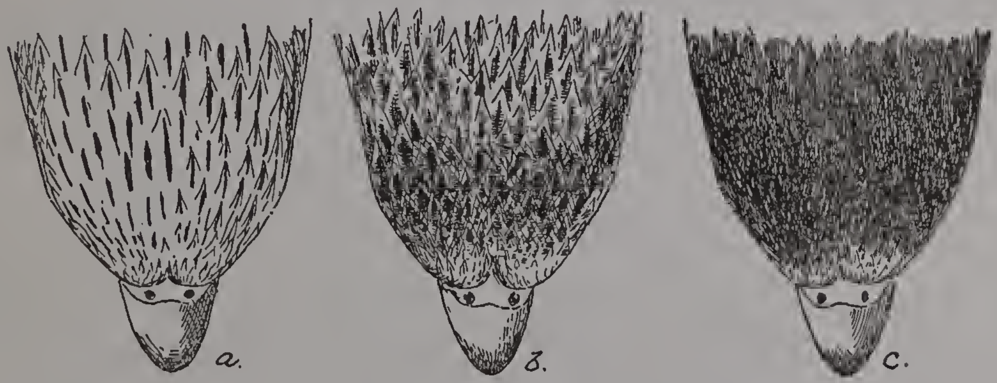


Figure 230
Crowns of subspecies of Gyrfalcons.
a, White Gyrfalcon. *b*, Grey Gyrfalcon. *c*, Common Gyrfalcon.

The Gyrfalcons were most highly regarded for hunting by the falconers of old and by the exacting laws of the times their use was restricted to persons of the highest rank. They combined all the spirit and hardihood of the smaller species with greater size and strength and hence were adapted for the largest game to be taken with Hawks. The Gyrfalcons are of far northern distribution in Canada and are very rare within the limits of settlement, rarely troubling poultry yards or game coverts; otherwise a war of extermination would probably have to be waged against them as they undoubtedly can be very destructive.

In Canada there are two species. They are circumpolar in distribution, occurring in the northern parts of both the Old and New Worlds.

There is considerable confusion regarding the relationship of the various forms of Gyrfalcon, and some of the generally recognized subspecies may eventually turn out to be but individual variations or phase plumages, and even both American species may possibly be united under one, as there is a most perplexing amount of intergradation between them.

353. **White Gyrfalcon.** *Falco islandus.* L, 22. A very large Falcon, mostly pure white, with small, sharp markings of brown or black.

Distinctions. The general whiteness. It may be pure white with only small, sparse, scattered, dark flecks on the wing tips, wings, or back; or the dark may even be predominant on wings and back, and sharply shaft-streak the crown (Figure 230 a). The lack of markings on the undertail coverts separates this species from similarly coloured individuals of Grey Gyrfalcon.

Field Marks. Long, sharp wings, and flight as a Falcon. Large size and white coloration as the White Gyrfalcon.

Nesting. On rocky cliffs.

Distribution. The Arctic regions of both hemispheres. Occurring in Canada across the Arctic, west to Dolphin and Union straits. Taken south occasionally on the southern British Columbia coast, and on the prairies as far south as the International Boundary.

354. **Gyrfalcon** (Including **Grey** and **Black Gyrfalcons**). *Falco rusticolus.* L, 20. A very large Falcon, similar to the White Gyrfalcon, but much darker, the markings of greyish, brown, or even near-black, being more extensive. The back may be solidly coloured, or more or less variegated with white; the crown is dark, sharply streaked with white or solidly dark (Figure 230 b and c). The breast may be white sparsely streaked or nearly solidly dark brown.

Distinctions. Recognized as a Gyrfalcon by its pointed wings, toothed bill, and large size. Separated from the White Gyrfalcon by darker coloration, especially the under tail coverts. The lightest phase of this species may approach closely in colour to the darkest of the preceding species. In general, however, in the White Gyrfalcon, white greatly predominates, but with this bird the white and dark are about equally extensive, or the dark predominates.

Field Marks. A very large Falcon, almost solidly dark; may be light in colour sometimes, but never with white predominating.

Nesting. On cliffs or in trees.

Distribution. The Arctic regions of both hemispheres. In Canada, across the continent, occurring occasionally in late autumn or winter almost anywhere in the Dominion. There are more records for Alberta than elsewhere in southern localities, and those of British Columbia are confined to the southern coast.

SUBSPECIES. The Gyrfalcon shows a remarkable amount of variation, and scarcely two specimens are exactly alike. Judging from captive birds this does not seem due to age or sex, nor is it easily correlated with distribution, yet the American representatives of the species have been divided into three geographical races, based on colour. The lightest, the Grey Gyrfalcon *Falco rusticolus rusticolus*, approaches darker individuals of the White Gyrfalcon, but can be separated by its shaft-streaked or barred undertail coverts. The upper parts are solid lightish brown, or brown or greyish, barred with white. The flanks are striped or barred and the tail somewhat barred. The crown, broadly streaked with light and dark in approximately equal proportions (Figure 230 b) is perhaps the best criterion of the subspecies. The Gyrfalcon, having no distinctive common name, *Falco rusticolus gyrfalco* is the next darkest. The dark body markings are confluent ,and more extensive, showing more dark than light. The crown is practically solidly dark (Figure 230 c). Most of the prairie records seem to be of this form, but either of the two can be expected on the coast of southern British Columbia. The darkest form, the Black Gyrfalcon *Falco rusticolus obsoletus*, seems confined to our north Atlantic coast.

355. **Prairie Falcon.** *Falco mexicanus.* L, about 18. Like a pale or faded Peregrine. Much like the illustration of the juvenile of that species, Plate XXVII B, but more white below.

Distinctions. Recognizable as a Falcon by toothed bill (Figure 229) and pointed wing (Figure 228). Rather variable in size, but, considering above distinctions, likely to be confused only with the Peregrine Falcon. Similar in colour pattern to that species, but exhibits little change due to age. In any plumage the darker colours are in faded or light browns instead of dark brown, black, or bluish-grey. Below, the dark markings are less extensive, and never predominate over the white. Like the much rarer and larger Gyrfalcon, the first primary is shorter than the third, instead of being equal or longer.

Field Marks. Recognized as a Falcon by sharp triangular wings, fairly long tail, seldom spread in flight, rapid wing beat without sailing, and the repetition of a single harsh note when agitated. Very much like the Peregrine Falcon in size, outline, and action (*See* Figures 202–8 and 231), from which it is best distinguished in life by its pale, sandy coloration.

Nesting. On cliffs, in crevices, or under overhanging ledges, in the most arid localities.

Distribution. Western North America, south to southern Mexico. In Canada, the prairie regions of Saskatchewan and Alberta and the valleys of southern British Columbia.

The Prairie Falcon is the prairie and desert representative of the Peregrine and resembles that species in many ways. It has the same bold dash and gallant hardihood, but shows more inclination to prey on small mammals, instead of birds. On occasions it even turns seriously to grasshoppers and the crop of at least one specimen examined by the writer was filled with these insects. Of 8 other stomachs examined, 3 contained game birds; 5, other birds; 2, mammals; and 2, insects. The above is not a very reassuring record for the species, but it is a bird of the arid wilds and except in the neighbourhood of typical bad lands is rarely numerous enough to have any decided economic effect. The greatest complaint that can be normally laid against it is its tendency to visit the vicinity of grain elevators on the edges of prairie towns, and prey upon the domestic pigeons attracted by the spilled grain.

356. **Peregrine Falcon** (Including **Duck Hawk** and **Peale's Falcon**). *Falco peregrinus.* L, about 18. Plate XXVII B. Adult: slaty blue above, slightly barred and lightest on rump, darkening to black on crown and tip of tail. Below, white to cream, sharply barred with black on abdomen, flanks, and thighs.

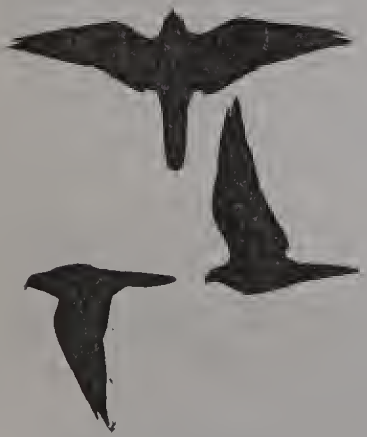


Figure 231
Peregrine Falcon.
Showing characteristic wing action and outline in flight.

Juvenile: dark brown above, slightly feather-edged with lighter. Below, dark brown, with broad feather-edges of cream, producing a striped effect but tending to bars on flanks. Breast, flanks, and upper abdomen with dark predominating; throat and lower abdomen lighter.

Distinctions. Recognizable as a Falcon by toothed bill (Figure 229) and pointed wing (Figure 228). Rather variable in size, but with above distinctions only likely to be confused with the Prairie Falcon. The juvenile Peregrine, however, is a dark brown, instead of a sandy, coloured bird, and the underparts may approach a solid brown, relieved by feather-edge stripes of cream to rufous-buff, instead of white or cream ground, with sparse brown spots or stripes.

The adult is distinctly slaty colour on the back, lightest on rump, darkest to nearly black on head and tail tip—colours that never occur on the Prairie Falcon. The faces of these two Falcons are distinctive, with a dark bar down each side of the face from the gape, a detail that can be seen for considerable distance. The first primary, when full grown, is usually longer than the third, sometimes equal to it, but very rarely shorter.

Field Marks. Recognized as a Falcon by sharp, triangular wings, fairly long tail seldom spread in flight, rapid wing beat without sailing, and wings descending on the down stroke as far as they ascend on the up beat (Figure 231). The note when agitated is a rapid repetition of a harsh *"Kack–kack–Kack–etc."* Hardly distinguished from the Prairie Falcon by size, outline, or action, but of stronger, darker coloration, nearly black above instead of sandy in adult, and the dark predominating in the underparts of the juvenile.

Nesting. On cliff ledges, but never under shelter of strong overhangs ,or in clefts; and always (?) in the immediate vicinity of water.

Distribution. The greater part of the northern hemisphere, south in winter to Africa and South America. In Canada, across the continent north to the Arctic islands, nesting wherever there are steep cliffs in the vicinity of water. On migration, more common about water than elsewhere.

SUBSPECIES. The American form of the Peregrine Falcon, the Duck Hawk *Falco peregrinus anatum,* is separated from the Old World representatives of the species by small details of colour. There is another race, Peale's Falcon *Falco peregrinus pealei,* from the northwest coast of Queen Charlotte islands and northward, that is distinguished by its average darker colour.

The Peregrine Falcon was, next to the Gyrfalcon, the most desirable hunting Hawk of the falconers of old, and is still used for this purpose by a few enthusiasts in the Old World, who keep up ancient traditions. In our imagination it is still associated with royal functions and court etiquette. Though of very wide distribution, it is nowhere common, and usually nothing more than a rare and picturesque visitor in Canada.

Economic Status. The size of the prey which this bird can take is remarkable. Even the Mallard is often struck down and successfully brought to land to be eaten. Near one nest, the writer found the remains of several full-grown Ruffed Grouse that must have been carried to it, but on the prairies Franklin's Gull seems to be its favourite prey. An examination of the stomach contents of 16 specimens gave the following results: 7 contained poultry or game birds; 9, other birds; 1, mice; and 2, insects. It is one of the few hawks that show a preference for feathered, over furred, food. Fortunately for itself, it is as wary as it is spirited, and rarely comes close to man's residence or his poultry yards. Its favourite hunting grounds are the mud-flats frequented by Shore Birds, or the marshes where Ducks congregate. An accomplished killer of wild fowl, the Peregrine is a thorough sportsman in its hunting, and captures its game by direct, irresistible attack, or straight pursuit, instead of crafty surprise, and, as a sportsman and an historical character, can claim some indulgence from human rivals. There should be enough game in the country to support so picturesque a character without arousing the jealousy of other hunters.

357. **Pigeon Hawk** (Including **Richardson's Merlin** and **Black Pigeon Hawk**). AMERICAN MERLIN. *Falco columbarius.* L, 10. A small Falcon, very similar in size and coloration to the Sharp-shinned Hawk. Adult male: back, pale slate blue (almost gull-blue), dark slate, or bluish-black, shaft-streaked with black. Tail, barred with the same blue, and with black in varying proportions. Below, white or cream more or less heavily streaked with ochre and brown, heaviest and darkest on flanks. Throat, pure, or nearly pure, white, immaculate or nearly so. Thighs, strongly tinged with warm buff, more or less brown streaked.

Adult female resembles the juvenile, with sometimes an approach to the blue back of the male.

Juvenile: back brown or sandy brown, to nearly black, slightly shaft-streaked. Tail, uniform dark, or barred with dark of back and greyish or buffy-white, the dark areas being wider than the light. Below, cream or deep buff, more or less heavily streaked with dark or sandy brown. Throat, light to white, sometimes immaculate, usually sparsely streaked.

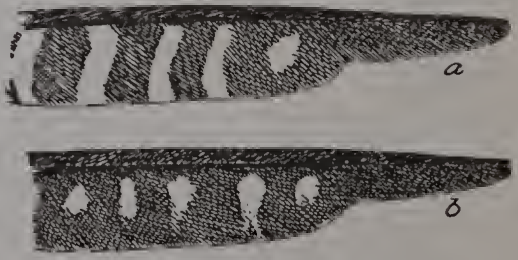


Figure 232
First primaries of Pigeon Hawks; scale, ½.
a, Common Pigeon Hawk and Richardson's Merlin.
b, Black Merlin.

Distinctions. Recognized as a Falcon by pointed wings and toothed bill (Figures 228 and 229). Distinguished from other Falcons except Sparrow Hawk by smaller size. Easily separated from that species by entirely different coloration, especially the absence of any red.

Field Marks. By small size, to be confused only with the Sparrow Hawk and the Sharp-shinned (*See* Plates XXVIII A and XXV A). Separated from the former by habits, habitat, and lack of any red in plumage, and from the latter by pointed instead of rounded wings, and falcon-like outline and action (Similar to Figure 231, compare with 207).

Distribution. Northern North America. In winter, as far south as northern South America. In Canada, across the continent, north to tree limit.

SUBSPECIES. The Pigeon Hawk is divided into three geographical races. The Eastern Pigeon Hawk *Falco columbarius columbarius* is the medium dark bird, breeding in the forest sections throughout Canada, except on the Pacific coast. Richardson's Merlin *Falco columbarius richardsoni* is a pale extreme, nesting on the prairies; the Black Merlin *Falco columbarius suckleyi* is a dark form of the west coast. In migration, both Richardson's and the Black Merlin occasionally wander into the interior valleys of southern British Columbia, and the Eastern Pigeon Hawk occurs commonly within the ranges of both the others.

Richardson's Merlin is very distinct from the Eastern subspecies, being very considerably paler and more like the Old World Merlin *Falco aesalon* than the Eastern Pigeon Hawk *Falco columbarius columbarius.* The blue of the back of the adult male may be described as gull-blue, being the same pearly shade as the mantle of some of those birds. Below, the stripings are pale, rather soft instead of sharp, and the white or cream ground plainly predominates. The back of the juvenile is light brown with blended rusty-ochre feather edges, giving a soft colour-effect like wet sand, instead of dark mud. Although the distinction from *columbarius* is not so great below, the darks never predominate over the whites, creams, or ochres of the ground colour. Probably the most distinctive character of this race is the crown: that of the Eastern Pigeon Hawk is always decidedly dark, having the effect of dark brown feathers with faintly lighter edgings; in Richardson's Merlin, the crown is lighter, having an effect of rusty-ochre feathers with soft, dark median lines.

In the Black Merlin, all the dark colours are sootier, and more extensive. The back of the adult male is much like that of the Eastern Pigeon Hawk, but blacker, and that of the juvenile is nearly black instead of dark brown. Below, in all plumages, the dark stripes are deeper in colour, broader and sharper in outline, and predominate over the lighter ground. The throat is generally plainly streaked instead of immaculate. The pattern of the first primary is usually a good test for this subspecies. In the Eastern Pigeon Hawk, the light barrings are sharp and clear, and extend right to the outer edge of the vane; in the Black Merlin, they are smaller, sometimes almost lacking, and do not run to the edge of the web (Figure 232).

In courage and spirit, this species is a miniature of the Peregrine Falcon, but it is more of a woodland bird, and is usually seen under less falconine conditions, dashing about the edges of copses, more like a Sharp-shinned Hawk, but when observed in straight-away flight in the open, its Falcon characters are plain.

Of 51 stomachs examined, 2 contained young chickens; 41, small birds; 2, mice; and 16, insects. It is apparent from this record that the Pigeon Hawk is destructive to small birds, and on occasions will take small poultry. Though more common than the larger Falcons, it is still far from numerous; this, together with its natural wariness, prevents it from becoming a serious pest to the poultryman. It often follows the Shore Bird flocks on migration, and seems particularly fond of the Black-bellied Plover. Though, individually, it has considerable possibility of harm to wild life, the species as a whole has little economic effect.

360. **American Sparrow Hawk** (Including **Desert Sparrow Hawk**). AMERICAN KESTREL. KILLY HAWK. *Cerchneis sparverius.* L, 10. Plate XXVIII A. A small Falcon of very distinctive coloration. The only small Canadian Hawk showing much red.

Distinctions. The coloration is very distinctive, expecially the red back and tail of the male, the general redness of the upper parts of the female, and the characteristic black and white face marking, which is common to both sexes.

Field Marks. The Falcon characters of pointed wings and long tail, small size, colour, habits of hovering stationary in the air and of pumping its tail up and down immediately after alighting.

Nesting. In holes in trees, usually a Flicker's deserted nest in the top of a high stump.

Distribution. North and South America. In Canada, across the continent north to the tree limit. Common nearly everywhere.

SUBSPECIES. From specimens examined, the writer can recognize but one form of Sparrow Hawk in Canada, *Falco sparverius sparverius.* The Desert Sparrow Hawk *Falco sparverius phalaena* has been said, incorrectly, to occur in our southern west.

This is the only common Falcon we have, and fortunately the one to which the least blame can be attached. It is a beautiful little bird, and the gayest coloured of our Hawks. The open fields, slashes, or brûlés are its hunting grounds, and the tallest of dead trees in the open its chosen observation post. It beats about over meadows, occasionally stops and hovers for a moment on quickly beating wings like a Kingfisher, and then drops upon its quarry.

Calling this bird a "Sparrow Hawk" is a slanderous misnomer. That name, by right of description and association with Old World forms, belongs to the Sharp-shinned Hawk, which is a confirmed small bird killer and a close relative of the European Sparrow Hawk. Grasshopper Hawk would be a far better descriptive term for this little Falcon, for grasshoppers are its favourite food.

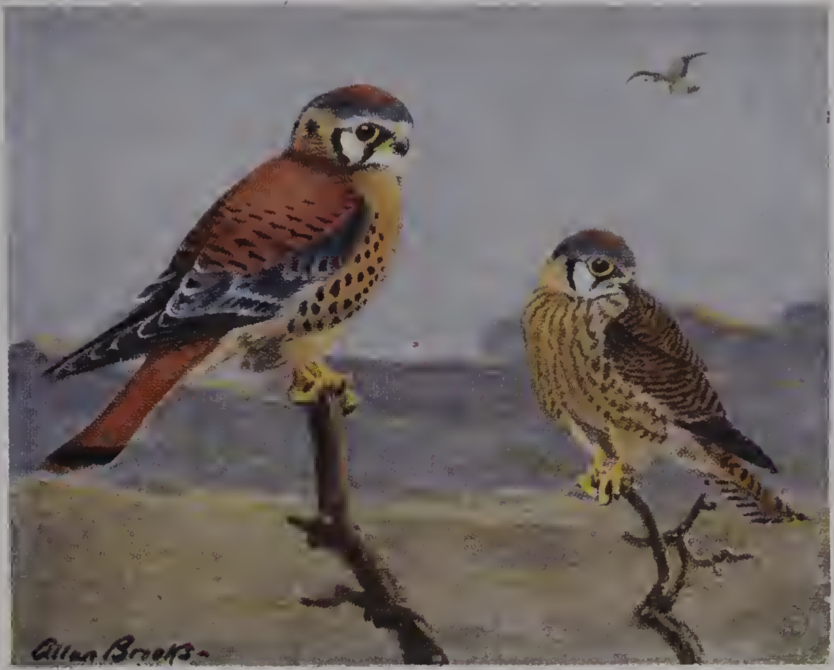
Economic Status. Although a true Falcon, this bird is one of the most efficient and valuable protectors of the farm. Of 291 stomachs examined, one contained a game-bird (Quail); 53, other birds; 89, mice; 13, other mammals; 12, reptiles or batrachians (frogs, etc.); 215, insects; and 29, spiders. Of the birds examined, 43 were taken in the winter months, from December to April. Of specimens taken in seasons when insects are available only 10 stomachs contained birds. This record shows that birds are killed by this Falcon from necessity rather than choice. The "other mammals" were mostly harmful rodents, with a very few shrews. The insects are usually grasshoppers which do great damage and are difficult to control. From the above evidence it is obvious that the Sparrow Hawk is beneficial and should be protected.

This is a bird that could be advantageously and successfully attracted about the prairie farms and ranch houses. Dependent as it is on Flicker or similar holes for nesting sites, its normal breeding is limited to the vicinity of trees of considerable size. However, it is very adaptable, and has followed the Flicker out along the telegraph lines into the most open country, utilizing for nesting the premises of the original excavator. Suitable bird-houses erected on poles on the barest prairie would quite likely be found and utilized by it.

FAMILY—PANDIONIDAE. FISH HAWKS. OSPREYS

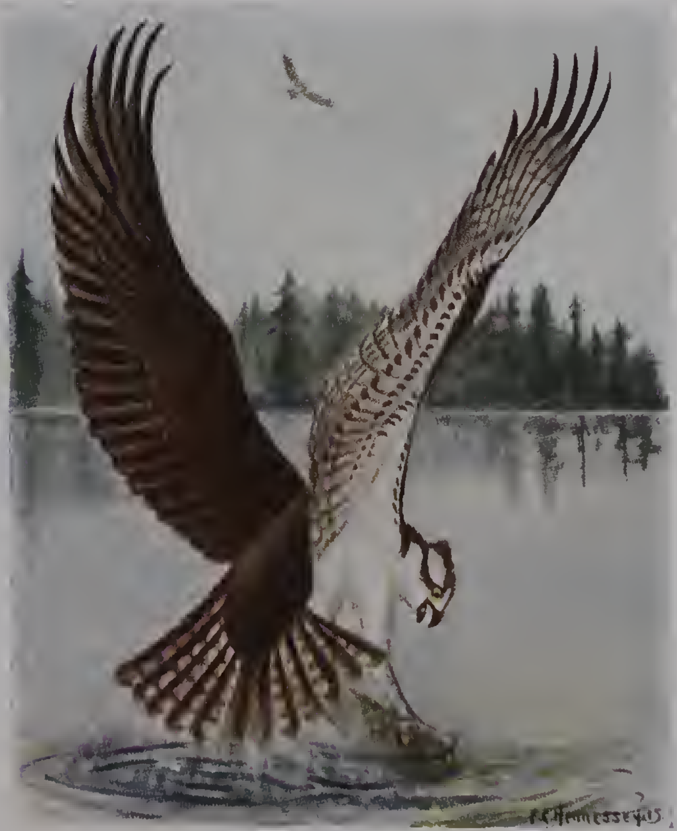
The Fish Hawks or Ospreys constitute a family of raptorial birds subsisting entirely upon fish, which they capture in shallow water by diving. Other members of the order eat fish, but usually only as scavengers

PLATE XXVIII



A. American Sparrow Hawk; scale, $\frac{1}{6}$

Male Female



B. Osprey; scale, $\frac{1}{10}$

or by stealing from fish-catching birds. As there is only one species of Fish Hawk in America, no general discussion of the family is necessary here.

364. **Osprey** (Including **American Osprey).** FISH HAWK. *Pandion haliaetus.* L, 23·10. Plate XXVIII B. A very large, dark brown (nearly black) and white Hawk, very white below without other markings than sometimes a vague, disconnected, band of suffused light brown spots across the breast.

Distinctions. A large brown and white Hawk, with pale blue feet, the soles of which are covered with sharp horny processes for grasping slippery fish. Head, largely white with contrasting black ear coverts, and a loose crest of white, dark-tipped feathers, from the hind head.

Field Marks. A very large Hawk (Figure 201–3), very white below, with a long wing expanse, almost eagle-like in outline, but with wing-tips less broadly rounded (Figure 233). Next smaller than the Eagles. The facial markings are quite distinctive, white throat, black bar over ears, and white nape and sides of rear head with distinct occipital crest. Habits of hunting over broad shallows and diving from the wing.

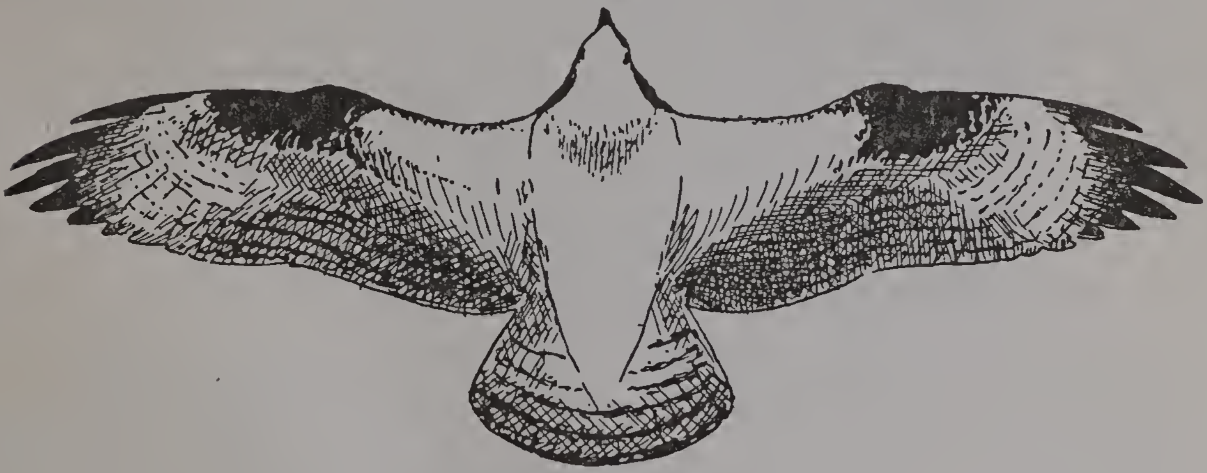


Figure 233
Osprey; scale, $\frac{1}{13}$.
General appearance in flight.

Nesting. Enormous nest of sticks in isolated tree tops, rarely on, or near, the ground. Nests are added to year after year and may assume the size of small haycocks.

Distribution. Nearly cosmopolitan. In the New World, North and South America. In Canada, across the continent, north to the tree limits, breeding locally and irregularly anywhere except in the open prairie country.

SUBSPECIES. The American Osprey *Pandion haliaetus carolinensis* is separated from the Old World form on the grounds of slightly larger size and small difference in colour.

The Osprey is a most picturesque feature of the broad shallow of inland waters, or the tidal flats of the sea. Sailing at a considerable height over the water, it pauses a moment on hovering wings, and then drops suddenly. It falls, not straight down like a Kingfisher, but in a long spiral, striking the water feet first, with wings raised high over its back. There is a splash of white spray and, for a moment, the bird, except for the black wing tips, is entirely hidden from view; then, with a heave of its powerful shoulders, it raises itself clear of the water and with one or two strong strokes rises in the air, a fish clasped in its rough talons, and returns to its aerie.

The term "Osprey", as applied by the millinery trade, has nothing to do with this bird. These graceful plumes are the product of a Heron or Egret, and the origin of the use of this confusing name for them is somewhat obscure.

The Osprey frequents broad, shallow, tidal flats, shallow bays, and clear water, where the fish on the bottom are exposed to view, and not too deep for capture. In the interior, the species is constantly growing rarer, but it seems to hold its own on the seacoast much better. Its great bulky nest, upreared conspicuously, and added to year after year until it attains the proportions of a small haycock, constantly invites attack from the human nest robber, who imagines that because the Osprey is a Hawk and eats a few fish it can claim no consideration at his hands. Next to man, its worst enemy is the Bald Eagle which pursues and forces it to drop the hard-earned result of its fishing. With a clever swoop, the bold raider catches the fish in the air as it falls, and makes off with his booty.

Economic Status. Though the food of the Osprey is entirely fish the antipathy that fishermen have for it is rather exaggerated. Feeding as it does in shallow waters it takes few fish of economic importance. On the coast, flounders, tomcod, and other small species form the bulk of its food. On the freshwater lakes, sunfish, perch, and suckers seem to be its staples. The number of game or marketable fish it catches is undoubtedly small. In eleven stomach examinations there was none. Trout streams are not attractive to the species and most of the valuable fish such as bass and pickerel usually lie too deep for it to catch.

SUBORDER—STRIGES. NOCTURNAL BIRDS OF PREY. OWLS

The Owls are easily recognized. The cere hidden in the feathers of the face, and the striking facial disk or feather rings about the eyes (Figures 234-238) are distinctive to the most casual observer. They are mostly nocturnal, but a few species habitually hunt by day and some others do so occasionally. Even the nocturnal Owls, however, see quite well by day. They may be momentarily dazed when brought suddenly from dark to bright light, and some species repose such confidence in immobility to escape detection as to allow themselves to be almost caught in the hand, but when finally they take flight they thread the tangled mazes of the tree tops and brush so unerringly that little doubt of their visual powers remains.

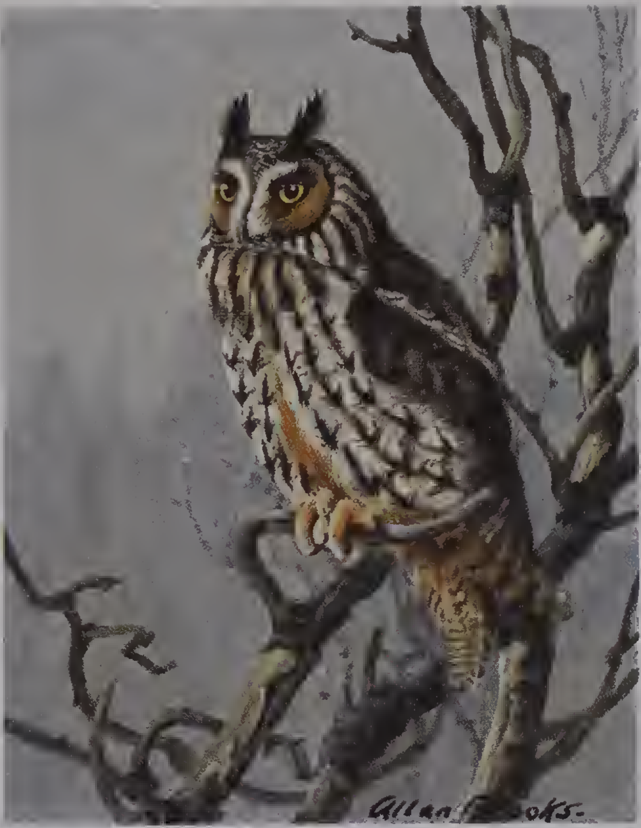
The feathers are a most interesting feature in Owls. They are peculiarly soft and cling together in a way that keeps the air from passing through the small interstices and ensures the silent flight characteristic of the suborder. An Owl can pass so closely as to fan the face with its wing and yet be inaudible.

Two families are represented in Canada: *Aluconidae* the Barn Owls, represented by one species which is an accidental visitor from the south; and *Strigidae* known as the Eared or Horned Owls, though many Canadian species of the family are without these feather ornaments.

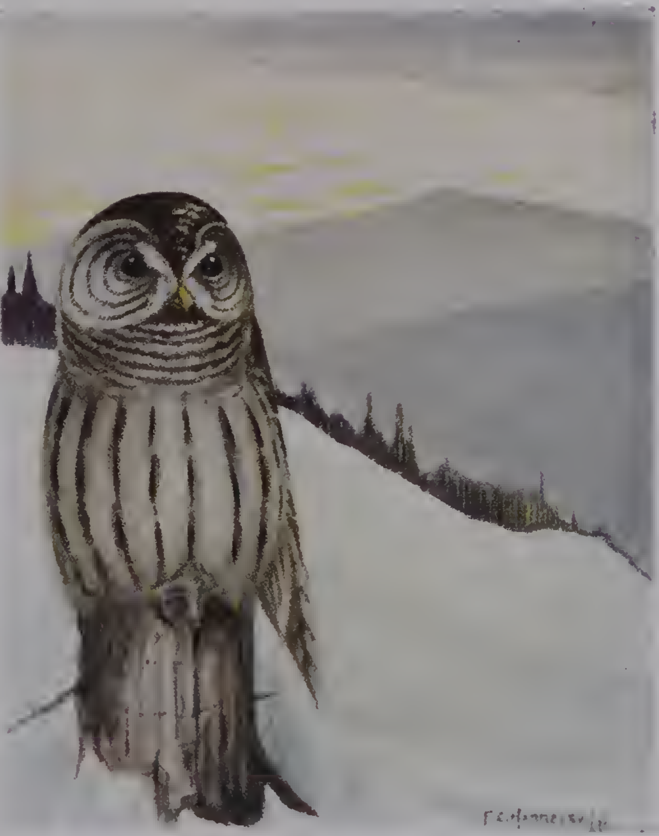
FAMILY—ALUCONIDAE. BARN OWLS

The Barn Owls, sometimes called the Monkey-faced Owls from the heart-shaped character of the united facial disks, are represented in Canada by only one species and that species is rare. The middle claw is pectinated, having comb-like teeth on its inner edge (like the Herons, Figure 20, page 26) and the inner toe is as long as the middle instead of being slightly shorter as in the Horned Owls.

PLATE XXIX



A. Long-eared Owl; scale, $\frac{1}{6}$



B. Barred Owl; scale, $\frac{1}{7}$

365. **Barn Owl** (Including **American Barn Owl**). MONKEY-FACED OWL. *Tyto alba.* L, 18. General ground colour a reddish ochre, lighter below, facial disk dull white with an outer edging of darker ochre, to brown. Back, to top of head, frosted over with ash-grey with numerous small eye-spots outlined in black. Underparts, throat, and around face, sprinkled with scattered round, dark spots.

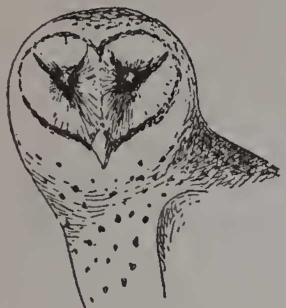


Figure 234
Barn Owl; scale, about ⅓.

Distinctions. The strongly outlined heart-shaped facial disk and black eyes, without horns or ear tufts (Figure 234), soft yellow coloration with a suggestion of pink, and the tarsi, almost bare of feathers, are distinctive.

Nesting. In towers, steeples, or holes in barns, banks, or trees.

Distribution. Nearly cosmopolitan in the warmer regions. In America, occurring across the continent, northward only casually across the Canadian boundary. There are single records for the species in Manitoba and southern British Columbia.

SUBSPECIES. The American bird is now regarded as a geographical race, of a nearly world-wide species, under the name of American Barn Owl *Tyto alba pratincola.*

This is the American representative of the ruin-haunting European Owl so familiar in song and story. It is a wonderfully efficient mouser and a most valuable bird, but is rare in Canada.

FAMILY—STRIGIDAE. HORNED OR EARED OWLS

The family is known as "Horned" or "Eared" from the tufts of feathers projecting from the forehead in some of the species, though not in all. It includes all the Canadian Owls except the Barn Owl previously mentioned. With the exception of the small Burrowing and the still more minute Pygmy Owls, all species mentioned here have the feet heavily feathered to at least the base of the toes. In these exceptions, the feathering of the feet is bristle-like and rudimentary.

366. **American Long-eared Owl.** BRUSH OWL. *Asio wilsonianus.* L, 14·80. A medium-sized owl, similar in general coloration to the darker race of the Great Horned Owl, but much smaller and of more slender build.

Distinctions. Although the colouring is suggestive of a dark Great Horned Owl, the difference in size easily separates the two; besides this, the Long-eared Owl has none of the fine, sharp vermiculation, above or below, that is so characteristic of the other species. From the Short-eared Owl, which is about equal in size and build, it may be distinguished by the prominent horns or ear tufts that spring from the centre of the forehead, by its lack of decided, sharp striping, and the amount of grey or black and white, that suffuses the body colour. The Long-eared Owl is softly striped below, but the stripes are somewhat crossbarred and there is much white overwash. The Short-eared Owl is sharply striped with brown on tawny and there is little if any crossbarring or white. It is decidedly a striped bird, the Long-eared is not.

Field Marks. The prominent horns standing up from the middle of the forehead, rusty-brown facial disks, and general greyness will differentiate this from the Short-eared Owl, the only species with which it is likely to be confused.

Nesting. In trees or bushes usually in the deserted nests of Hawks or Crows.

Distribution. Temperate North America. In Canada, across the continent, north to near the tree limit.

This is an Owl of the brush land and coulées. In dryer parts of the Prairie Provinces there is scarcely a wooded coulée that has not its pair of Long-eared Owls, raising their brood in the nest once built by a Crow or Buteo. Brooding here or perched in the shadowy thicket, through the day, it sallies forth to the prairie level at night, carrying death and destruction into the ranks of the small nocturnal rodents. That it takes occasional feathered game on opportunity is evident from stomach examination, but the species cannot be an important economically harmful factor because of this. It is notable that, although many coulées harbour a pair of this species, it is invariably absent from those occupied by its larger relative, the Great Horned Owl.

Evergreen or alder thickets on the edges of marshes or ash swamps are the preferred habitat of the species. During migration it is sometimes found in companies, resting by day in the dark recesses of wet woods.

Economic Status. Of 92 stomachs examined, 1 contained a game-bird (Quail); 15, other birds; 84, mice; 5, other mammals; and 1, insects. From this record it is evident that the species is not seriously destructive. Its mousing proclivities are sufficient to give it a claim to protection and its small size and nocturnal habits prevent its interference with young poultry (at least those that are properly cared for at night).

367. **American Short-eared Owl.** MARSH OWL. *Asio flammeus.* L, 15·50. A medium-sized Owl. Much smaller than the Barred or Great Horned, but larger than the Screech, or the Burrowing Owls. Similar in size and build to the Long-eared. In general, an ochraceous or buffy bird striped with brown; stripes sharply defined and narrower below; softly diffused and broader above. Small, inconspicuous eartufts rise from centre of forehead (Figure 235).

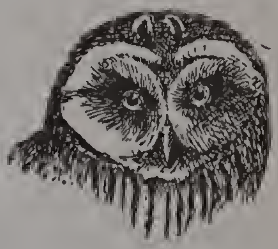


Figure 235
Short-eared Owl;
scale, ½.

Distinctions. Likely to be confused only with the Long-eared Owl. The general light buff colour, and brown stripes without any pure white, are distinctive of this species. The ear tufts may be so poorly developed as to be almost absent. The body colour varies in individuals, and may be as light as rich cream, or deep enough to have a slight suggestion of rusty. Distinctly a striped bird.

Field Marks. Size, general buffy colour, and habitat.

Nesting. On the ground, in dry marshes.

Distribution. Nearly Cosmopolitan. In Canada, in all suitable localities north to the Arctic ocean.

This bird is a true Marsh Owl and is slightly more diurnal in its habits than many of its relatives. It is often seen in the dusk of the evening beating over the marshes in strong and hawk-like flight. As it lives in the marshes or along their brushy edges, a great number fall annually to the guns of thoughtless sportsmen after other game.

Economic Status. Of 97 stomachs examined, 11 contained small birds; 77, mice; 7, other mammals; and 7, insects. From this record and from the fact that the marsh edges, waste patches, and fence-rows which this species haunts, are the reserves from which small rodent pests spread over cleanly cultivated land, it is evident that this is a most useful species and that killing it is removing one of the most efficient checks upon innumerable pests.

368. **Barred Owl.** *Strix varia.* L, 20. Plate XXIX B. A large hornless, black-eyed Owl, smaller than the Great Horned; coloured in brownish grey and white.

Distinctions. The only other round-headed Owls this species resembles are the Spotted and the Cinereous. It is too far removed in range from the former to be confused with it. The smaller size, black instead of yellow eyes, and combination of sharply barred breast and striped underparts, will separate it easily from the Cinereous.

Field Marks. Size, absence of ear tufts, and general grey-brown colour with bars across breast.

Nesting. In hollow trees or in deserted nests of Crows or Hawks.

Distribution. Eastern North America. In Canada, west to, and including, southern Manitoba.

SUBSPECIES. Several subspecies of Barred Owl are recognized. The only one that occurs in Canada is the northeastern one, the type race, *Strix varia varia.*

Though apparently a fairly large bird the Barred Owl, when stripped of its feathers, is comparatively small. Added to this it is a bird of gentle nature and lacks the keen aggressiveness of some of its relatives. Its notes are loud, the weird hooting carrying far in the still, night air.

Economic Status. Though fowls have been known to roost repeatedly without harm in trees from which Barred Owls hooted every night, the latter are usually regarded as enemies and killed indiscriminately. Of 189 stomachs examined, 5 contained poultry or game; 13, other birds; 46, mice; 18, other mammals; 4, frogs; 1, a lizard; 2, fish; 14, insects; 2, spiders; and 9, crawfish. The fowls, only two cases, can be regarded as accidental, probably offal or carrion, as they were both taken in January, when ordinarily the fowl would be full grown and beyond the powers of this weak Owl to kill. The status of this bird is most satisfactory.

369. **Spotted Owl** (Including **Northern Spotted Owl**). *Strix occidentalis.* L,20. A large, round-headed, hornless Owl, with black eyes, of same size and general appearance as the Barred (Plate XXIX B), except that it is rich wood-brown instead of ashy-brown and darker below; the light, dark-striped underparts of the Barred Owl being represented by dark feathers with large white spots along their sides, and showing the buffy ochre of the under plumage. The general effect of the underparts suggests barring rather than striping.

Distinctions. Most like the Barred Owl, but so separated from it in range as to make confusion very improbable. The only Owl it is likely to be mistaken for is the much larger and yellow-eyed Cinereous.

Field Marks. The only large, round-headed Owl likely to be met with in summer time in southwestern British Columbia. Much smaller and browner than the Cinereous.

Nesting. In hollow trees, probably similar to the Barred Owl.

Distribution. Western North America, north to the boundary. In Canada ,occurring rarely only in extreme southwestern British Columbia.

SUBSPECIES. Two subspecies are recognized. The form to be expected in Canada is the Northern Spotted Owl *Strix occidentalis caurina.*

This is a rare species anywhere, and has been taken in Canada on only a few occasions.

370. **Cinereous Owl.** GREAT GREY OWL. *Scotiaptex nebulosa.* L, 27. Of much the same general grey tone as the Barred Owl, but considerably larger.

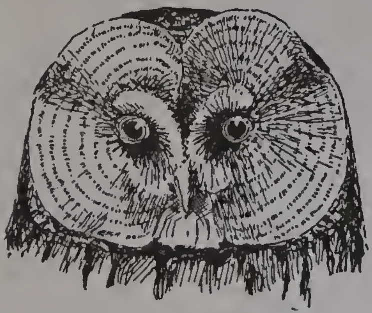


Figure 236
Cinereous Owl; scale, ⅓.

Distinctions. By measurement and in appearance the largest of our Owls, but when stripped of its abundance of soft feathers, a surprisingly small bird. Like the Barred Owl in general coloration and lack of horns; but with yellow instead of black eyes (Figure 236), and having the coloration of the breast and underparts diffused, and without a definite pattern of stripes and bars.

Field Marks. Size, grey coloration, and lack of breast-bars.

Nesting. In trees.

Distribution. The forests of the north, across the continent.

SUBSPECIES. The Cinereous Owl occurs in the northern parts of both the New and Old Worlds, but is represented in each by distinct subspecies. The European form is the Lapp Owl *S. n. lapponica,* and the American is the Great Grey Owl, the type race.

This Owl is only a winter visitor in the settled parts of Canada.

Economic Status. What economic influence this bird effects is a beneficial one. Data on its food are rather scarce. Of 9 stomachs examined, 1 contained a small bird; 7, mice; and 4, other mammals. It is evidently an efficient mouser.

371. **Arctic Owl** (Including **Richardson's Owl**). *Cryptoglaux funerea.* L, 10. A small, hornless, brown and white Owl. Rich blackish-brown above, with semi-concealed, round, white spots; white below, vaguely striped. The colour pattern is soft and the design vague and diffused.

Distinctions. Slightly smaller than the Screech Owl, and hornless. Larger than the Saw-whet, which is the only species with which it is likely to be confused. Differs from that species in being a rich, warm, blackish-brown, instead of rather reddish, greyish-brown. The light facial disk is in sharp contrast with the surrounding dark ring, instead of blending softly into it. An Owl of this type, with a wing over 5·5 inches, will be this species.

Field Marks. A small, round-headed Owl, larger and richer brown in colour than the Saw-whet.

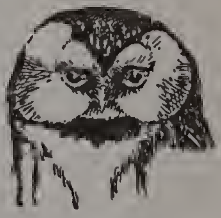


Figure 237
Richardson's Owl; scale, ⅓.

Nesting. In holes in trees.

Distribution. Northern parts of northern hemisphere. In Canada, across the continent in the northern coniferous forest, usually coming into southern sections only in winter.

SUBSPECIES. The American Arctic Owl is separated from the European form under the name of Richardson's Owl *Cryptoglaux funerea richardsoni.*

This is a very irregular and occasional winter migrant throughout most of our cultivated sections.

Economic Status. Though too rare to have any noticeable economic influence it must be regarded as a beneficial species. Of 9 stomachs examined, 1 contained a small bird; 7, mice; and 4, other mammals.

372. **Saw-whet Owl** (Including **Island Saw-whet Owl**). ACADIAN OWL. *Cryptoglaux acadica.* Excepting the Pygmy, the smallest of our Owls. Above, almost solid chocolate-brown. Facial disk on crown and sides of head, bordered with many fine, short, white lines, extending back over crown (Figure 238a). Below, white, broadly and softly streaked with a slightly paler shade of the back colour; or—the same, but the white replaced by light rusty buff. A plumage of this Owl, rarely seen, was long thought to be a distinct species, and was called Kirtland's Owl, but is now demonstrated to be only an evanescent juvenile plumage of the Saw-whet. This juvenile is solid brown above, redder than the adult, the brown extending across breast as a rufescent band. Below the breast-band, the abdomen is rusty-ochre, without stripes. The facial disks are almost black (Figure 238b), in striking contrast with the white above, and between the eyes.

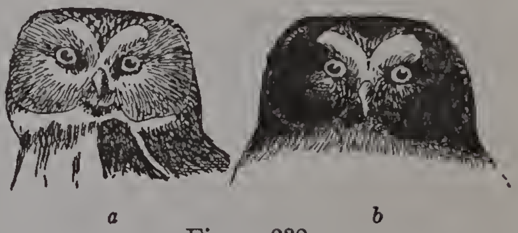


Figure 238
Saw-whet Owls; scale, ⅓.
a, adult. *b*, juvenile.

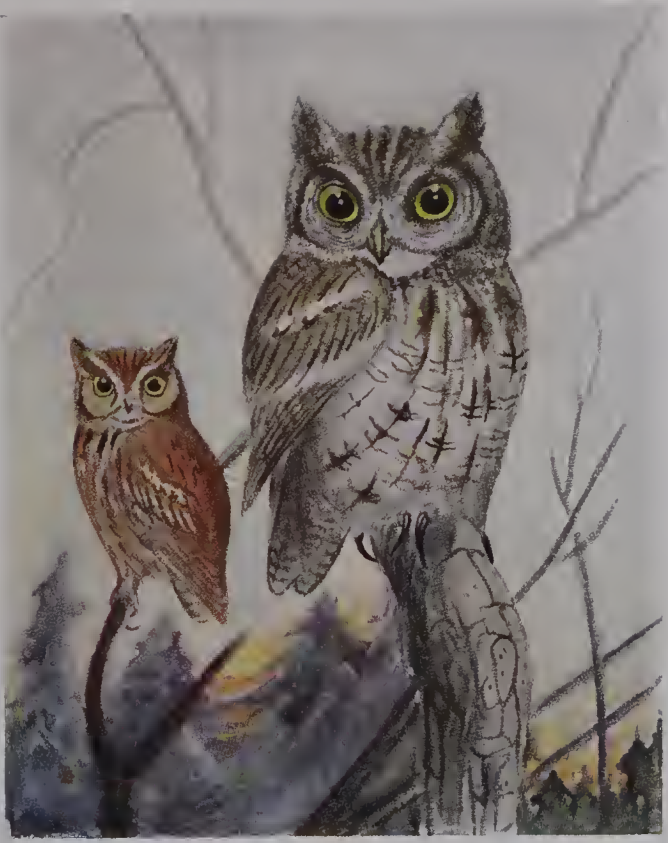
Distinctions. With small size, round, hornless head, and general coloration, likely to be confused only with the Arctic Owl. Differs from that species in being of a redder and greyer brown, especially the stripes below, and in the facial disk blending into the crown with but little contrast (compare with Figure 237). An Owl of this type, with wing between 5½ and 4 inches, will be this species.

Field Marks. A small, round-headed Owl, smaller, and of paler and more blended colour than the Arctic.

Nesting. In holes in trees, sometimes natural cavities, at other times those made by Woodpeckers or squirrels.

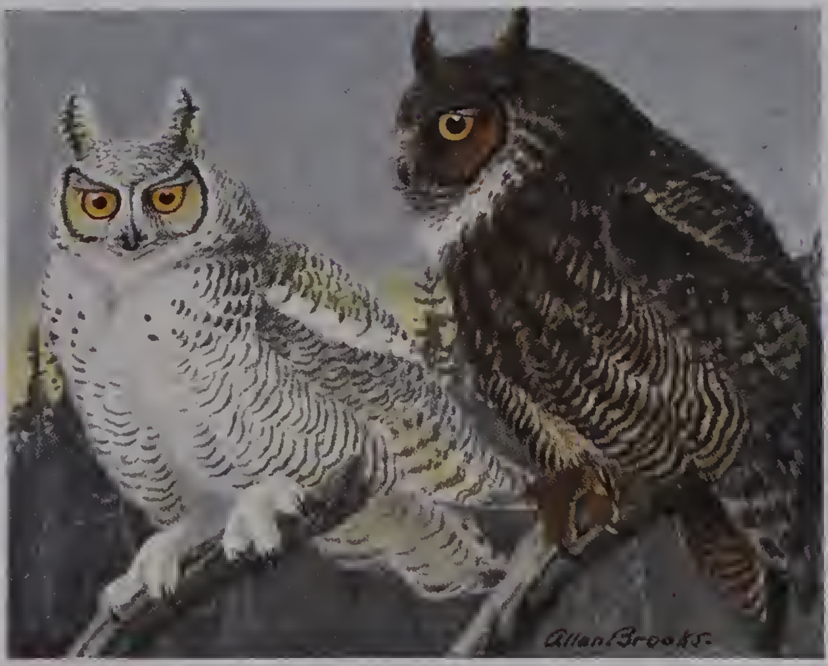
Distribution. Most of temperate North America. In Canada, in wooded sections, probably not north of latitude 60°.

PLATE XXX



A. Screech Owl; scale, $\frac{1}{4}$

Red phase Grey phase


Allan Brooks.

B. Great Horned Owl; scale, $\frac{1}{8}$

Arctic Horned Owl Dusky Horned Owl

SUBSPECIES. Two subspecies of the Saw-whet Owl are recognized in Canada. The Acadian Owl *Cryptoglaux acadica acadica* inhabits most of the Dominion. The Island Saw-whet *Cryptoglaux acadica brooksi* is at present known only in Queen Charlotte islands. It is like the Acadian, but in adults the whites are replaced by rufous ochre. In the young the colours are all richer and darker than in the young of the Acadian. The difference between these two races is very striking and the absence of known intergrades suggests that *Cryptoglaux acadica brooksi* may be a distinct species. The North-west Saw-whet *Cryptoglaux acadica scotaea,* heretofore ascribed to the Pacific coast of Canada, has lately been dropped as being identical with the Acadian Owl.

This diminutive Owl haunts the dark tangle of cedar and tamarack swamps and similar localities, passing the day close to the trunk of a tree where its plumage blends indistinguishably with the bark. It has such great reliance in its protective coloration that it will allow close approach and can at times be almost taken in the hand. It takes its vernacular name from its call-notes, which are said to resemble the sound made by filing or whetting a saw.

Economic Status. Of 19 stomachs examined, 1 contained a Sparrow; 17, mice; and 1, a moth. With this record the species deserves protection.

373. **Screech Owl** (Including **Rocky Mountain, MacFarlane's,** and **Kennicott's Screech Owls**). *Otus asio.* L, 9·40. Plate XXX A. A small, eared Owl. The eastern race occurs in two well-marked colour phases, irrespective of age, sex, or season. One is rich brown and white, with much fine pattern, giving a grey effect, the other has the brown replaced by bright rufous, almost brick red. The western races, however, are single phased, resembling the grey plumage of the eastern race, but of a ruddier brown.

Distinctions. With one very rare exception, the Flammulated Screech Owl, the only horned Owl with wing under 7 inches. Easily known from that species by having yellow, instead of black, eyes.

Field Marks. Size, and the distinct horns, are the best field marks. Its call, a long quaver, is very distinctive.

Nesting. In hollow trees.

Distribution. Nearly all of temperate North America, but in western Canada detected as yet only in southern Manitoba, and southern British Columbia.

SUBSPECIES. The Screech Owl is divided into a number of geographical races. Manitoba birds have been identified as the Eastern Screech Owl *Otus asio asio.* They are in the grey phase, and whiter than any eastern bird with which they have been compared, and hence, approach the Rocky Mountain Screech Owl *Otus asio maxwelliae* of Montana and westward. In southern British Columbia, we have MacFarlane's Screech Owl *Otus asio macfarlanei* in the interior, and Kennicott's Screech Owl *Otus asio kennicotti* west of the Coast range. These are both single phased, of the grey type, or if two phases can be recognized, the red colour is much subdued and not nearly as brilliant as in the Eastern race. The browns are always warmer and redder than the Eastern form, and, the coast birds especially, are of darker general colour.

Although called "Screech" Owl, the notes of this bird certainly are not screeches. They may be heard at night coming from a distant copse, melodious and soothing, with a tinge of melancholy, and contain nothing harsh or grating. The commoner call is a long, soft, tremolo whistle. An imitation will bring the original author close up to see what rash stranger Screech Owl invades its chosen haunts, and it challenges with answering whistles and chuckles. When undisturbed by intruders, the notes include an infinite number of low croons and gurgling tones. Occasionally Screech Owls can be induced to nest or rest in boxes, and every day, as evening approaches, the alert round head and feather-ringed, yellow eyes framed in the opening and awaiting the coming dusk, is a pretty sight. Though generally inoffensive, Screech Owls sometimes show surprising courage in defence of their fledgling family. At night the parent bird will boldly attack, sweeping down at the head of the intruder with a startling, hollow-sounding *"who-who"* and snapping bill. This is usually little more than a demonstration, however, and, just before striking, it wheels up into the darkness again to gather momentum for a return. Such attacks, although sometimes disconcerting, are far from dangerous, and more a source of amusement and admiration than alarm.

Economic Status. The official finding on the food of the Screech Owl is warrant for its protection. Of 212 stomachs examined, 1 contained poultry; 38, other birds; 91, mice; 11, other mammals; 2, lizards; 4, frogs and toads; 1, fish; 100, insects; 5, spiders; 9, crawfish; 7, miscellaneous; 22, scorpions; and 2, earthworms. The poultry item must be regarded as an accidental occurrence, as the bird represented, a Pigeon, would be exceedingly large prey for this Owl.

The loss of the small birds it takes under natural conditions may be regarded with equanimity. Unless individuals depopulate our bird houses and garden preserves, little can be said against the species.

374. **Flammulated Screech Owl** (Including **Dwarf Screech Owl**). *Otus flammeolus.* L, 6·50. Like a small, grey Screech Owl, but with dark, instead of yellow, eyes.

Distinctions. Like a very small, light grey Screech Owl, but with dark eyes, and toes naked to their base.

Field Marks. Too rare to be recorded on eyesight observation, but very small size ear tufts, and dark eyes will serve to distinguish this species.

Nesting. Similar to the Screech Owl.

Distribution. Too few specimens of this species have been recorded to base a detailed distribution upon them. It has occurred irregularly from British Columbia to Guatemala, and east to Colorado.

SUBSPECIES. Two subspecies are recognized, the Dwarf Screech Owl *Otus flammeolus idahoensis* being the northern race, and the one accredited to the Dominion.

We know hardly anything of its habits, but presume they are similar to those of the Screech Owl. One found dead on the lake shore at Penticton, British Columbia, is the only Canadian record.

375. **Great Horned Owl** (Including **Arctic, Western, Pacific,** and **Northwestern Horned Owls**). CAT OWL. *Bubo virginianus.* L, 22. Plate XXX B. A large Owl, over 15 inches, with prominent horns. It may vary from a dark bird with much black only touched with white here and there, and slight ochre tints showing through from the undercoat, to largely or nearly entirely white, with much, or little, fine, sharp black vermiculation, and a buff to cream undercoat.

Distinctions. The only Owl over 15 inches in length with prominent horns. The finely vermiculated pattern, and buffy under plumage, differentiate it from the broadly barred or spotted, and hornless, Snowy Owl, with which the whitest specimens of Great Horned might possibly be confused.

Field Marks. Large size and prominent horns or ear tufts.

Distribution. The greater part of North and South America. In Canada, across the continent, north to the tree limit.

SUBSPECIES. The Great Horned Owl is a very variable species and divides into a number of geographical races. Many attempts have been made to define them, but when tested by specimens of breeding birds, none of them is entirely satisfactory. The following races are recognized in Canada in the American Ornithologists' Union Check-list. The typical Eastern Great Horned Owl *Bubo virginianus virginianus* contains much warm ochre and neither black nor white is particularly prominent. This bird should occur in eastern Manitoba. The extreme of whiteness is shown by the Arctic Horned Owl *Bubo virginianus subarcticus* that in certain cases may be almost pure white, with little ochre showing anywhere, and the black pattern very much reduced in prominence. It inhabits the North West Territories, the northern parts of the Prairie Provinces, and probably parts of the Yukon. The Western, or Pale, Horned Owl *Bubo virginianus occidentalis* is about intermediate between the Eastern and the Arctic, and is a light coloured bird, characterized by much light ochre underplumage. It is to be expected in the southern parts of the Prairie Provinces. Throughout the mountains in British Columbia we have a dark form, the Pacific Horned Owl *Bubo virginianus saturatus.* This is more like the Eastern Horned Owl, but is much blacker. It occupies southern British Columbia. In Northern British Columbia and adjoining parts of the Yukon is a similar black form, the Northwestern Horned Owl *Bubo virginianus lagoponus.* It is interesting to note that these dark western forms are almost identical in coloration with the Labrador Horned Owl, although separated from it by thousands of miles, and with an almost white race between. This may be regarded as a case of parallel development; similarity of conditions producing similar coloration. The foregoing is a generalized description and distribution of the west Canadian subspecies of Horned Owls; the birds themselves do not quite adhere to either perfectly, and many confusing problems occur. During migration several forms may be found together in winter. The resident Owls in the southern parts of the provinces nest before some of the far northern breeders leave for their summer stations, and dates are, therefore, not reliable as evidence for the separation of resident from migrant birds. The birds nesting do not always show the expected racial characters and typical *subarcticus* with young may be taken near our southern borders and well marked *occidentalis* in the far north.

The species is suspected of being dimorphic to some extent, and the blacker coloured birds are supposed to occur in all races. There is, of course, the usual amount of intergradation between the races, that marks them as subspecies instead of full species, and altogether the problem of properly classifying the Great Horned Owls is a difficult one, and not to be successfully or satisfactorily undertaken until a far larger series of specimens is available for comparison.

The Great Horned Owl is the evil genius of the woods. Winding silently through the shadowy foliage, along the steep mountain or coulée sides, it is monarch of all it surveys, except the larger animals. In a natural state it fears no enemies save man, and all the lesser animals and birds cower at its soft, hushed flight. In minor affairs, however, it has not things always its own way. Often one will hear a great protracted outcry from the Crows, and the black clans will be seen gathering to a common point where great excitement prevails. As likely as not, a Great Horned Owl will be found the centre of attraction. Some sharp-eyed Crow has seen the sleepy bird hugged close against a tree trunk, awaiting the coming of the night. The alarm once given it is taken up by throat after throat, and soon all the corvine neighbourhood joins the mobbing. They surround him, screaming in his face and making dashing feints, at which he braces himself, and snaps a hollow sounding bill, but rarely has a chance of using his terrible talons against his agile and discreet tormentors. The Owl cannot throw them off; it retreats from tree to tree, but, at the first movement, the black mob renews its screams, trails away after, and never loses sight of its quarry until the falling shades send all Crows off to roost. Then the tables may be turned, and the occasional piles of glossy black feathers scattered about the ground show that revenge is especially sweet when it also furnishes a meal. It is difficult to say which, Crow or Owl, has the observer's sympathy, but perhaps the thought suggested is that "When knaves fall out, honest men prosper." Like other Owls, the Great Horned Owl answers and comes readily to an imitation of its deep "*Whoo-who-who*" challenge at night.

Economic Status. The economic status of this bird depends upon where it lives. In the deep woods away from settlement it is, of course, harmless to man and only the wild creatures it preys upon are affected by it. In settled districts it is to be guarded against in every possible way. Of 110 stomachs examined, 31 contained poultry or game-birds; 8, other birds; 13, mice; 65, other mammals; 1, a scorpion; 1, fish; and 10, insects. The evidence, is, therefore, decidedly against this Owl. There is no danger that over-restriction will result in its extermination since it is perfectly able to take care of itself and there are large sections of wilderness where the species can hold sway without molestation.

376. **Snowy Owl.** *Nyctea nyctea.* L, 25. As large as the Great Horned Owl, but without horns, and pure white, usually with many, but sometimes only a few, broad, dark bars on all parts of body except face. Occasional birds are almost immaculate.

Distinctions. A large, hornless Owl, pure white, or white sharply barred with dark. Only possible of confusion with very white Horned Owls, but the round head, the body pattern broad and bold instead of fine and vermiculated, is distinctive.

Field Marks. A large, very white Owl, with round head.

Nesting. On the ground of the tundra.

Distribution. Northern parts of northern hemisphere. In America, across the northern Barren-grounds, southward in winter.

This is a winter visitor in the settled parts of Canada. It frequents frozen marshes and lake shores and is essentially a bird of the open. Usually the birds that come from the north are heavily marked juveniles, but occasionally flights occur in which the very white and almost unspotted adults are in the majority. Probably the juveniles are naturally greater wanderers than the adults, which migrate far from their home grounds only when driven out by a scarcity of food.

Economic Status. The food of the Snowy Owl consists largely of feathered game. Of 26 stomachs examined, 2 contained game birds; 9, other birds; and 20, mice, rats, and rabbits. Were it not that this Owl comes down into civilization after most of our birds have left it might do serious damage.

Though a big and powerful bird, feeding largely on Ptarmigan and rabbits in its native north country, comparatively few complaints are substantiated against it when it comes south during migration. It does not often visit the farmyard, and normally its depredations on Grouse do not seem serious.

377. **Hawk Owl** (Including **American Hawk Owl**). *Surnia ulula.* L, 15. Plate XXXI A. A medium-sized Owl of hawk-like appearance and habits. Facial disk not as perfect as in most Owls, and tail long.

Distinctions. The less flattened and less typically owl-like face, long tail, and sharp and regular barring below, are distinctive.

Field Marks. Diurnal habits, general coloration, and long tail are good field marks. In flight, except for its larger, more owl-like head, it has a strong resemblance to a Goshawk. Any Owl, seen perched in a commanding position in full daylight, is probably this species, though both the Long and the Short-eared Owls occasionally hunt by day.

Nesting. In evergreen trees or in holes in tree trunks.

Distribution. Northern parts of northern hemisphere. In Canada, in the northern wooded forests, across the continent and among the mountains at the higher elevations. Migrating in winter through most of southern Canada. More common near the mountains and in the foot-hills than out on the open prairie.

SUBSPECIES. The Hawk Owl of America is separated from that of the Old World as the American Hawk Owl, *Surnia ulula caparoch.*

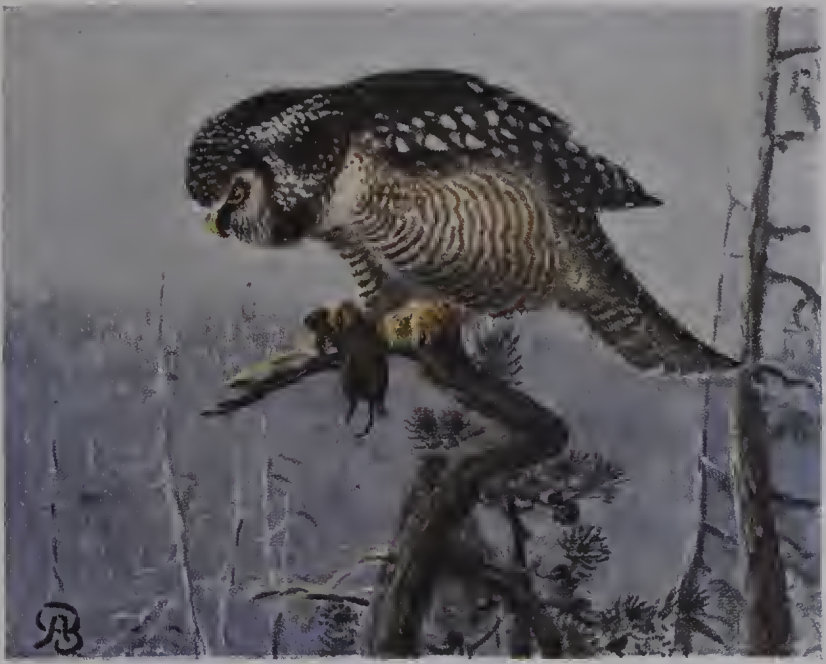
378. **Burrowing Owl** (Including **Northern Burrowing Owl**). BILLY OWL. *Speotyto cunicularia.* L, 9·50. Plate XXXI B. A small, round-headed, stumpy-bodied, long-legged Owl, of light brown, or sandy, and white, coloration, of rather indefinite pattern.

Distinctions. Small size, round head, bare toes, and legs only scantily feathered in front, and pale, sandy coloration make this species unmistakable.

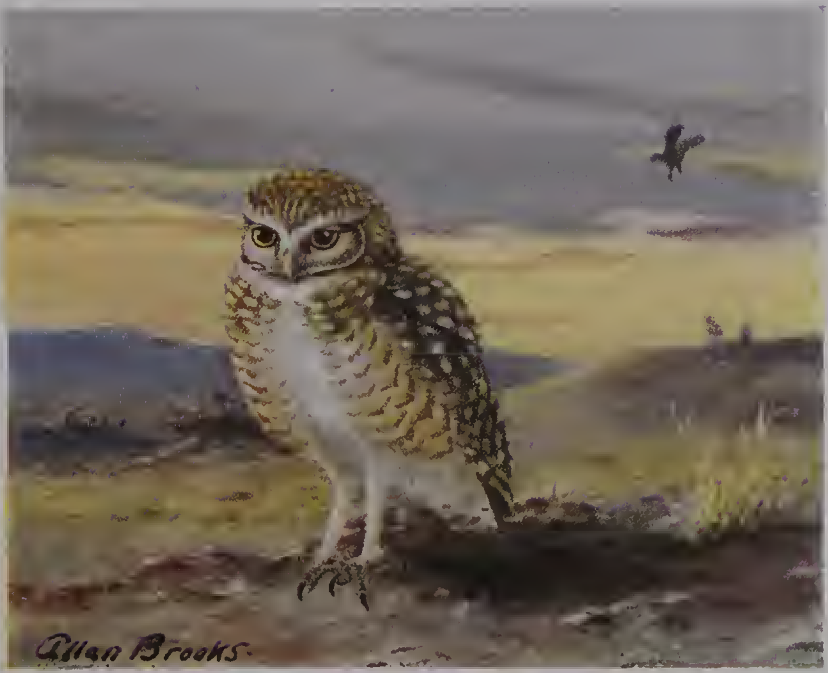
Field Marks. A small, sandy-coloured ground Owl, inhabiting open prairie country; short stumpy body and long legs are easily recognizable in life.

Nesting. In holes made in the ground of the open prairie by gophers, badgers, or other animals.

PLATE XXXI



A. Hawk Owl; scale, $\frac{1}{6}$



B. Burrowing Owl; scale, $\frac{1}{6}$

Distribution. Western United States from southern Canada to Mexico, east in the south, to Florida and the islands of the gulf of Mexico. In Canada, across the southern boundary, north to about the Canadian Pacific main line in the three Prairie Provinces, and the southern ends of the valleys in the interior of British Columbia.

SUBSPECIES. The Canadian form is the Northern Burrowing Owl *Speotyto cunicularia hypogaea,* that inhabits most of the United States.

A very odd little Owl, and the one around which has grown the myth of living in friendly harmony in the same burrow with prairie dogs and rattlesnakes. It can often be seen standing in the bright warm sun, a round bunch of feathers with long, un-owl-like legs, perched on the little mound of earth thrown up from its burrow, or on some small commanding elevation nearby. When disturbed it flies off with a musical little whistle or gradually disappears backwards down into the depths of the ground, the last thing seen in the darkness of the tunnel being the reflections from its bright, yellow eyes. About the burrow, vast numbers of weathering pellets may be seen. Examination shows that the majority of these are mouse and small rodent remains, but in British Columbia, where the Poor-will is common in Burrowing Owl country, its woody-brown mottled plumage is commonly intermixed with the mammal remains, showing that small birds are acceptable when opportunity for taking them presents itself, and also that those that haunt the night suffer from the creatures of darkness.

Economic Status. Of 32 stomachs examined in southern United States, 30 contained insects; 3, small mammals; and 3, lizards. That this is not a complete story, for Canada at least, is shown by the formerly mentioned regurgitated pellets about the nest-holes, but very little harm can be charged against the species, and there is much to its credit.

379. **Pygmy Owl** (Including **California, Vancouver,** and **Coast Pygmy Owls**). *Glaucidium gnoma.* L, 7. Plate XXXII A. A very diminutive Owl. Scarcely longer than many Sparrows, though of heavier build. Coloured in wood browns and white.

Distinctions. Extreme small size, considerably smaller even than the Saw-whet. Sharply striped underparts; general wood-brown above, and a large, soft, black spot bordered with white on either side of the hindneck. Unmistakable for any other species.

Field Marks. Extremely small size for an Owl. Wood-brown above, and white underparts sharply striped with dark. Much diurnal activity.

Nesting. In holes in trees.

Distribution. Western North America, mostly west of the Rockies. In Canada, practically confined to British Columbia; in the interior, north into Cariboo district, but west of the Coast range, at least as far north as Wrangel, Alaska.

SUBSPECIES. The Pygmy Owl is divided into a number of subspecies of which three have been recognized in Canada. The California Pygmy Owl *Glaucidium gnoma californicum* is the interior bird, the Coast Pygmy Owl *Glaucidium gnoma grinelli* that of the coast, and the Vancouver Pygmy Owl *Glaucidium gnoma swartht,* of Vancouver island. *Californicum* has a slight greyish cast in the brown, whereas *swarthi* is darker and more reddish, has the white markings reduced, and more dark on the legs, *grinelli* in colour is about intermediate between them.

An extraordinary and interesting little Owl. It is largely diurnal, and so small that one naturally expects it to have a gentle and unassertive disposition. This, however, is far from being the case. If the reaction of the small woodland birds to its presence is any evidence, this little raptor, no larger than many of them, must be one of their worst enemies. Its friends would call it courageous and determined; its enemies, ferocious and bloodthirsty. Pause anywhere in its haunts, and whistle an imitation of its call—a half whistle, half spoken *"Cook-cook,"* followed by hollow, woodeny, staccato whistles succeeding each other slowly at first, but with a gradually accelerated tempo, and every small bird within hearing will come to investigate. The Nuthatches, hanging head downward, waving their heads like pendulums, and pointing their straight, upturned bill first to one side and then to the other, quanking as they do so. The Chickadees, *"dee-deeing,"* their beady eyes twinkling with curiosity. Buzzing, squeaking, excited Hummingbirds will hum angrily around. Sparrows, Wrens, Vireos, Warblers, Jays, and many others, hurry with anxious cheeps to the spot, from the deep tangles of the brush, the middle thicket of the branches overhead, or even the topmost tip of the giant yellow pines, and press in excited review about the alarum. With this call, bird study is made most easy in the difficult country of British Columbia, and no ornithologist there can afford not to learn it. If another Pygmy Owl hears the call, it comes immediately to challenge the intruder, sometimes two come together, find in each other the opponent they were seeking, and join in furious if elf-like combat. This is not direct evidence of the bird's food habits, but is a good indication, and suggests that it is only its exceedingly diminutive size that limits its power of destruction and excludes it from the short list of wholly obnoxious Birds of Prey.

Economic Status. The examination of six stomachs of southwestern birds showed insects and lizards in two of them, a white-footed mouse in another. Evidently, besides the bird-eating proclivities suggested by the preceding paragraph, it eats some insects, and is a mouser as would be expected.

Order—Coccyges. Cuckoos and Kingfishers

Systematic zoologists are not agreed on the classification of these birds. The present American Ornithologists' Union Check-list (1910 edition) recognizes them as composing a full order and divides the Canadian representatives into two suborders: *Cuculi*, including the American Cuckoos and extralimital families, and *Alcyones*, the Kingfishers. Distinctive characters are most easily described under the subfamily and specific headings.

SUBORDER—CUCULI. CUCKOOS, ETC.

This suborder is represented in North America by only one family, *Cuculidae*, comprising the Anis and two groups of Cuckoos.

FAMILY—CUCULIDAE. AMERICAN CUCKOOS

A family represented in North America by three subfamilies, only one of which occurs in Canada—*Coccyzinae*, the American Tree Cuckoos.

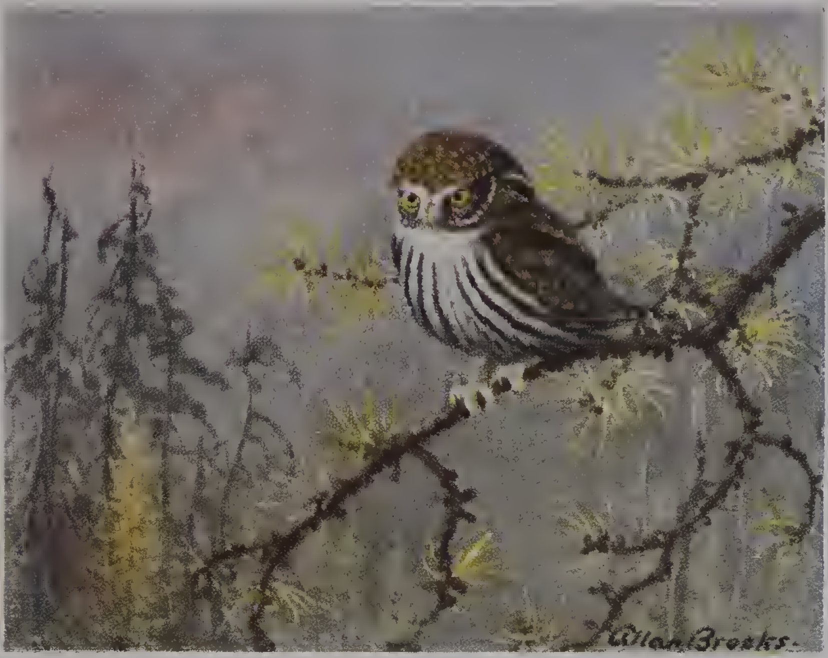
Subfamily—Coccyzinae. American Tree Cuckoos

General Description. Birds with weak feet and yoke toes, two toes directed forward and two backward (Figure 239). The bills are rather long, gently curved, and sharp pointed (Figure 239). The plumage is soft and thin, lacking in cohesion, and has the soft silky feeling associated with many tropical species. The tail is long, soft, and graduated.

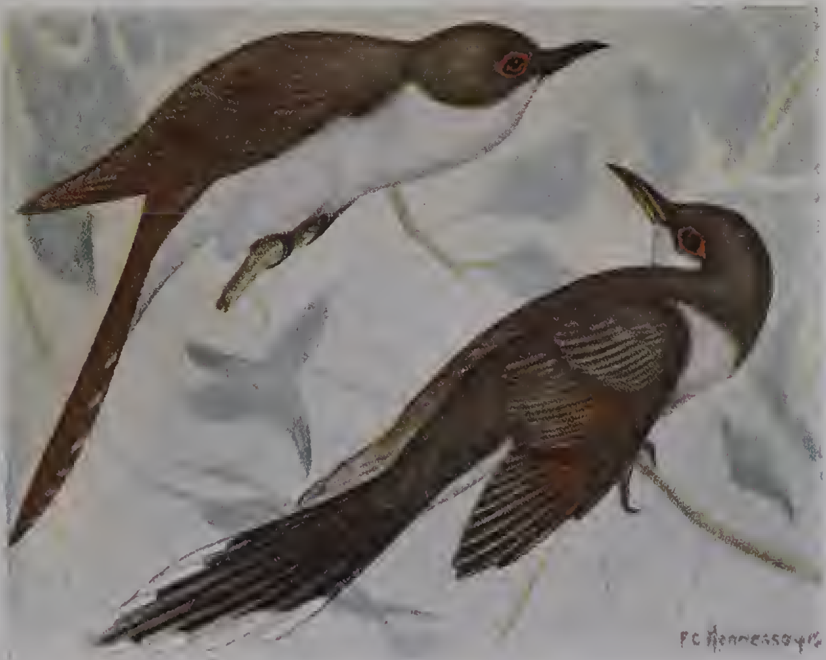
Distinctions. May be distinguished from the Woodpeckers, which also have yoke toes, by the difference in the bills and tails. In the Woodpeckers, the bills are straight, stout, the tip chisel-pointed, and the tail is rather short, very stiff, and bristle-like at the tip (Figure 241).

The Cuckoos are largely tropical in distribution. The two Canadian Cuckoos are outliers from the main body of species in warmer latitudes.

PLATE XXXII


Allan Brooks.

A. Pygmy Owl; scale, $\frac{1}{6}$



B. Black-billed Cuckoo; scale, $\frac{1}{3}$
Yellow-billed Cuckoo; scale, $\frac{1}{3}$

They are possessed of a tropical grace and air that are out of keeping with northern climes. This is exhibited in their lithe, sinuous carriage; full, round, deep throat; long, graceful tail; and thin but soft and silky plumage. They haunt hot and humid jungles of shrubbery, and flit across the open spaces with a silent undulating flight that seems in harmony with their exotic nature. English literature is rich in references to the Cuckoos, but little that is so said is applicable to the Canadian Cuckoo. The latter is not an early-arriving species and comes in spring with a quietness that hides its presence for some time after arrival. Its notes, too, are entirely different from those with which European writers have made us familiar. The calls of our birds are less musical but have a charm of their own and a wildness and unusual quality in keeping with their natures. The two Canadian species are very much alike in their calls; a loud, startling "*Kaow-kaow-kaow*" is the most characteristic and one that, on the still summer air, can be heard for a quarter of a mile or more. Again they have a "*Kuck-kuck-kuck*" note like a big clock beating seconds, that has not the range of the above but has considerable carrying power. In regard to their parental duties, our birds show considerable more realization of responsibility than the European. They are slightly parasitic in their habits, that is, they occasionally drop their eggs in the nests of other birds and shelve upon them the cares of raising their young, but the practice is not common and is perhaps only accidental. It may suggest the origin of the parasitic habit in other species. The old English word "cuckold" refers to and is based upon this habit of the European bird.

Economic Status. Cuckoos are almost entirely insectivorous, but occasionally take small amounts of wild fruit. The great value lies in the fact that they show special fondness for certain insects that other species rarely touch. Hairy caterpillars which, on account of their bristly coatings, are safe from more fastidious birds, are regularly eaten by Cuckoos. The interior of a Cuckoo's stomach will be found lined with a coating of spiny caterpillar bristles set in the walls and projecting from them like fur.

387. **Yellow-billed Cuckoo** (Including **California Cuckoo**). *Coccyzus americanus* L, 12·20. Plate XXXII B. Olive-fawn above; all white below; long tail, with outer feathers tipped with white. Curved bill, the lower mandible largely yellow.

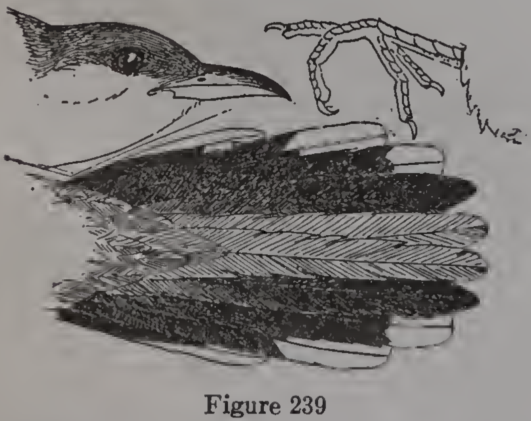


Figure 239

Specific details of Yellow-billed Cuckoo; head and foot, scale, ½; tail, scale, ⅓.

Distinctions. To be mistaken only for the Black-billed Cuckoo, but too rare in western Canada to cause much confusion. It is distinguished, however, by the yellow lower mandible; a cinnamon suffusion on the wings, conspicuous in flight; tail feathers, except centre ones, mostly black, and with large, white tips (Figure 239).

Field Marks. The long, flexible outline in flight, and general colour, make this species recognizable as a Cuckoo. The yellow bill, cinnamon wing patches, and tail largely black with conspicuous white tips, are best specific field marks. In western Canada, only likely to be seen in southwestern British Columbia.

Nesting. A loose structure of sticks, not far from the ground, in thickets.

Distribution. Temperate North America, north to just across our border. Absent from the Prairie Provinces. Known only in western Canada, from southern British Columbia, west of the Coast range.

SUBSPECIES. Two subspecies are recognized. The Eastern Yellow-billed Cuckoo *coccyzus americanus americanus* occurs west to Minnesota, and may some day straggle north into southeastern Manitoba. The California Cuckoo *coccyzus americanus occidentalis* is the western form from Lower California, northward. In the south it extends east to Colorado, but in the north it is confined to the coast districts, and only enters Canada in southern Vancouver island, and the adjoining mainland west of the Coast range.

388. **Black-billed Cuckoo.** *Coccyzus erythrophthalmus.* L, 11·85. Plate XXXII B. Olive-fawn above, all white below, long tail, outer feathers only slightly tipped with white. A slightly curved black bill.

Distinctions. To be mistaken only for the Yellow-billed Cuckoo, but in western Canada normally too far removed from it in range to allow of much confusion. It is distinguished from that species by all-black bill, practically an evenly coloured wing, black on tail only in faint subterminal bar, and the white tail-tips reduced to thumb marks.

Field Marks. The long, flexible outline in flight and general colour make this species recognizable as a Cuckoo. The black bill, lack of conspicuous cinnamon patches on wing in flight, and tail the same colour as the back, and with only small white tips, are the best specific field marks. The presence of Cuckoos in the neighbourhood will always be known by their characteristic notes, especially a slow, measured *"kuck-kuck-kuck"*, etc., and the bird is more often heard than seen.

Nesting. A loose structure of sticks near the ground, in thickets.

Distribution. Eastern North America. In Canada, west in the southern parts of Manitoba and Saskatchewan, and perhaps adjoining Alberta. Slightly more northern in its range than the Yellow-billed.

SUBORDER—ALCYONES. KINGFISHERS

The Kingfishers form a well-marked group represented in nearly all parts of the world. Though evidently adapted to catching fish some have given up their ancestral habits and watery habitats to live in the woods on insects and earthworms. However, all these departures from type are extralimital and mostly tropical; the well-known Laughing Jackass of Australia is a large aberrant Kingfisher. The North American Kingfishers are all included under one family *Alcedinidae.*

FAMILY—ALCEDINIDAE. KINGFISHERS

As there is only one species of the family in Canada, the description given under the species will serve for the family.

390. **Belted Kingfisher** (Including **Northwest Coast Kingfisher**). *Ceryle alcyon.* L, 13·02. Plate XXXIII A.

Distinctions. The great ragged crest and slaty blue back of the Kingfisher cannot be very well confused with any other American bird. The weak feet, three toes in front, the two outer (Figure 240) joined for half their length, and the peculiar clumsy grasping surfaces are diagnostic of the Kingfishers.

Field Marks. The ragged crest and large head, general coloration, a habit of sitting motionless on a perch overhanging the water or diving into it with a splash, and its harsh, rattling cry make the Kingfisher easily recognizable in life.

Nesting. Usually on the ground at end of a tunnel driven in the face of an exposed earth bank.

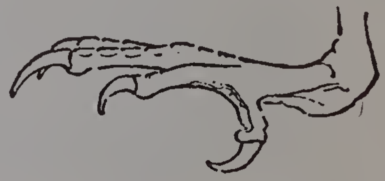
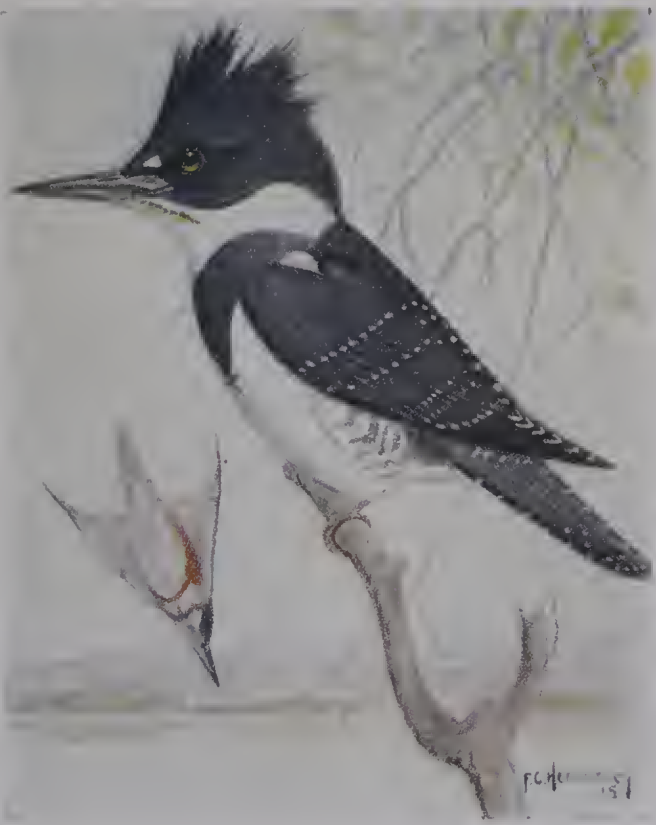


Figure 240
Foot of Kingfisher; natural size.

Distribution. All North America, breeding wherever found in Canada.

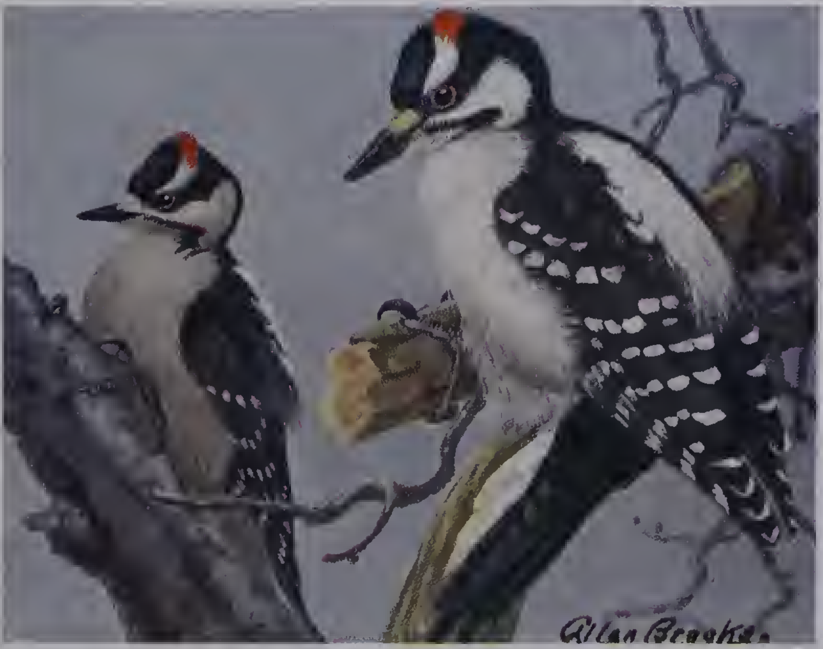
SUBSPECIES. The Belted Kingfisher is divided into two subspecies by present authorities. The Eastern Belted Kingfisher *Ceryle alcyon alcyon* ranges across most of the continent. The Northwest Coast Kingfisher *Ceryle alcyon caurina*, with a range as suggested by name, is described as having wings of a slightly different proportion, but the difference is slight, and it is not clear how far inland this form extends.

PLATE XXXIII



A. Belted Kingfisher; scale, $\frac{1}{4}$

Female (diving)   Male



B. Hairy Woodpecker; scale, $\frac{1}{3}$

Harris's Woodpecker   Northern Hairy Woodpecker

Both males

All frequenters of Canadian waters know the Kingfisher. It sits motionless on a commanding perch over the water watching for the fish below. Suddenly it dashes off, hangs suspended a moment in the air, and then drops with a resounding splash into the water, rising a moment later with a luckless fish in its capacious bill, and is off around the bend of the stream. Within its daily range the Kingfisher knows every perch and branch from which it can get a comprehensive view of its fishing grounds and returns to them again and again. Streams are not its only habitat; it frequents lakes, ponds, and seashore. Kingfishers fish sometimes at considerable distances from their nests, as they are often seen in country where earth banks such as they require for nesting are few. However, they are adaptable and sometimes use the most unexpected substitutes, such as the earth clingling to the roots of an overturned tree, or the sides of a drainage ditch.

Economic Status. The Belted Kingfisher lives upon small fish, and whether or not this constitutes a grave economic offence is a question that cannot be answered offhand. The minnows caught by this bird along our larger streams, ponds, or lakes are certainly not of importance, but when Kingfishers frequent small preserved trout streams they may possibly commit rather serious depredations. Their effect on the larger salmon waters is less clear. Ordinarily the fish they take are small perch, shiners, chub, and other minnows that frequent the surface or shallow, warm water. The number of young game-fish that are taken cannot be great. On waters given to the culture of trout the question is different. The fish taken there are comparatively well grown and, even if the Kingfishers are not very numerous, they cannot be looked upon with friendly eyes by the angler. However, the evil done by this species can easily be exaggerated.

Order—Pici. Woodpeckers

The world-wide order *Pici* is a rather heterogeneous division including numerous subdivisions, and there is little uniformity of opinion as to their exact relations. In Canada, there is only one family of the order—*Picidae*, the Woodpeckers.

FAMILY—PICIDAE. WOODPECKERS

General Description. The Woodpeckers are an easily recognized family. They have either three or four toes ending in well-hooked claws for clinging to the rough bark of trees, and, as in the Cuckoos, two are directed forward. In one group, the Three-toed Woodpeckers, one of the hind toes is absent. The bill is straight, stout, and chisel-shaped at the tip. The tail is well developed; not remarkably long, but stout, and ending in stiff bristles that are commonly worn and frayed by pressure against rough bark (Figure 241).

Distinctions. Feet, bill, and tail characters make reliable distinctions.

Field Marks. Tree-climbing habits; and flight by series of quick wing-strokes with slight pauses between, causing a waved course like a succession of festoons.

Nesting. In holes excavated in trees or stubs.

The Woodpeckers are well known for their ability to cling to perpendicular or overhanging surfaces. The stout, chisel-shaped bill is admirably adapted to drilling into wood whence the larvæ of borers or other insects are extracted. The tongue is long and extensible, and in most species furnished with a sharp point, armed with minute barbs to assist in holding the impaled prey and withdrawing it from the wood

(Figure 241 f). The hyoid or tongue bones are so long that in the normal position of rest they wind over the base of the skull along the crown and in some species penetrate the nostrils beneath the bill-sheath and finally rest their ends near the tip of the bill. As a further aid, large salivary glands secrete a sticky fluid for the tongue, to which small insects stick and are caught as with birdlime. A few species, for example the Sapsuckers, have the tip of the tongue frayed out into a sort of brush, that is evidently used in gathering up sap (Figure 241 e).

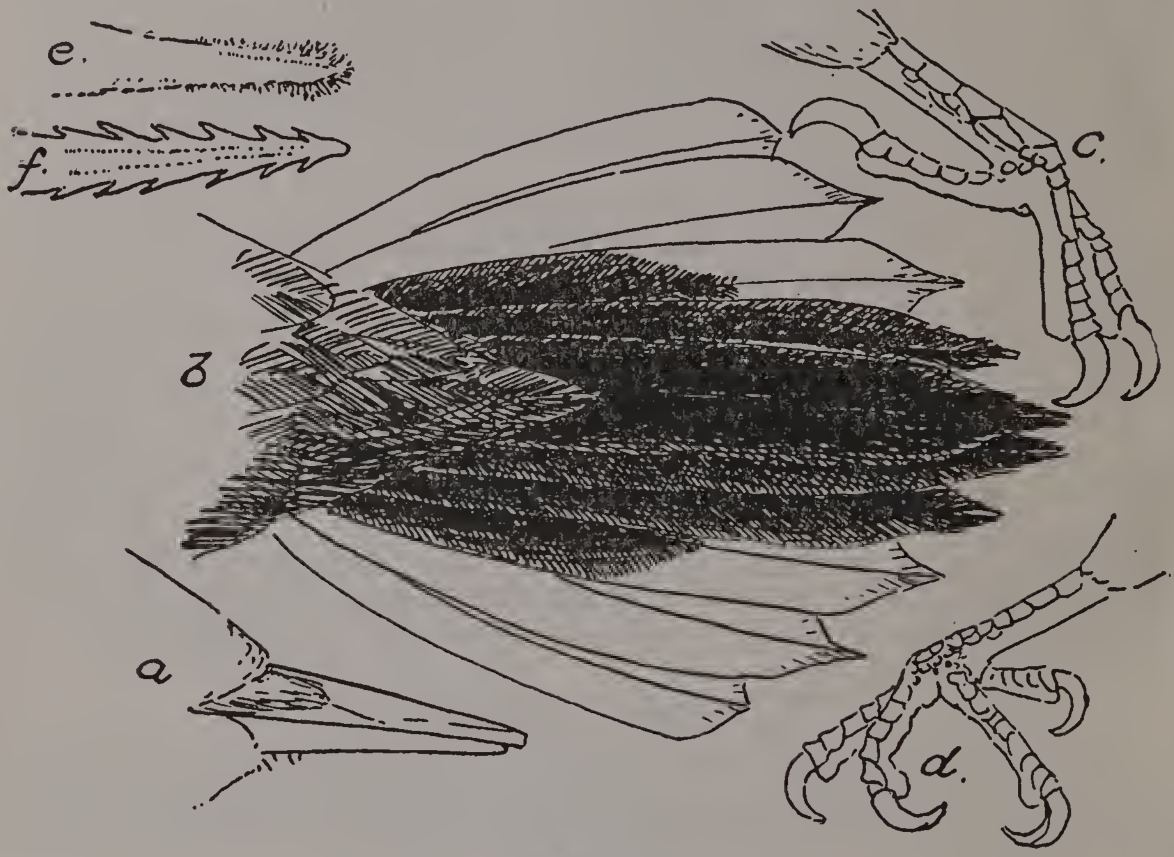


Figure 241

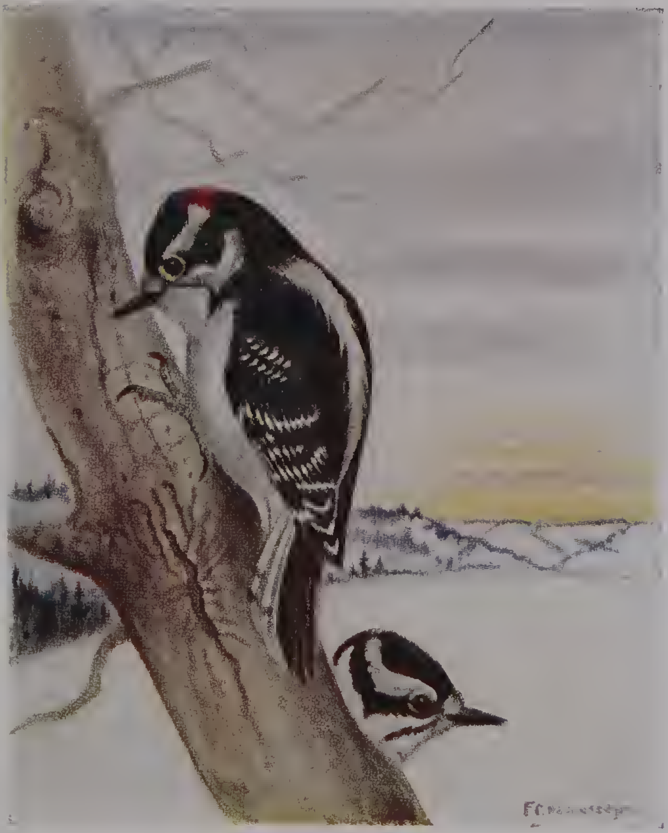
Characteristic details of Woodpeckers.

a, chisel-shaped bill.
b, stiff tail of pointed feathers.
c, three-toed foot.
d, four-toed foot.
e, tongue tip of sapsucker (greatly enlarged).
f, tongue tip of typical woodpecker (greatly reduced).

Economic Status. Of the general usefulness of the Woodpeckers, with the exception of the Sapsuckers, there can be little doubt. They are almost entirely insectivorous. They pursue wood-boring grubs by drilling holes in even apparently healthy though really infested trees and are, therefore, beneficial, not harmful.

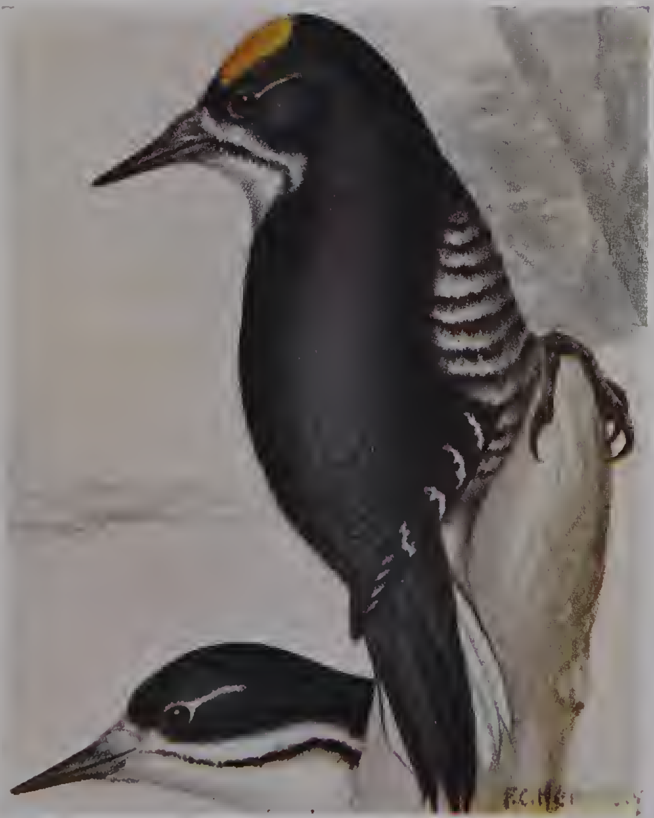
393. **Hairy Woodpecker** (Including **Northern, Rocky Mountain, Queen Charlotte Island, Sitka,** and **Harris' Hairy Woodpeckers**). *Dryobates villosus.* L, 9·40. Plate XXXIII B. A black and white Woodpecker, the only other colour on it is in the two bright red nape spots on the male. Near the west coast, the whites may be slightly, to heavily, tinged with smoky brown.

Distinctions. With its sharply contrasted black and white, or black and smoky white, most likely to be confused with its smaller relative, the Downy Woodpecker, which parallels it in all its plumages, and of which it is a larger edition. An additional difference is the outer tail feathers, which, in the Hairy, are solid white, instead of being barred with black (Figure 241 b, compare with Plate XXXIV A).



A. Downy Woodpecker, scale, $\frac{1}{3}$

Male Female



B. Arctic Three-toed Woodpecker; scale, $\frac{1}{3}$

Male

Female

Field Marks. Black and white, or black and smoky white, coloration. Many white spots. Separated from the Downy Woodpecker by larger size.

Nesting. In holes drilled in tree trunks.

Distribution. The wooded parts of North America. In Canada, wherever there is timber.

SUBSPECIES. Divided into a number of geographical races. The type form, *Dryobates villosus villosus*, is the eastern one extending into southern Manitoba, and perhaps into adjoining parts of the other Prairie Provinces. North of this is found the Northern Hairy *Dryobates villosus leucomelas* which differs from *villosus* only in slightly larger size. It occupies the great north woodlands of the interior, south to northern British Columbia, and most of Alberta, Saskatchewan, and Manitoba. The Rocky Mountain Hairy Woodpecker *Dryobates villosus monticola*, as its name suggests, is the bird of the interior of southern British Columbia, extending southeastward to Colorado. It is of the size of *leucomelas*, but with the white spotting of the wing-coverts reduced. Harris' Woodpecker *Dryobates villosus harrisi* is the Hairy Woodpecker of the Pacific coast, from Oregon, north to Sitka. It is a very different looking bird from those before mentioned, having the whites of the breast decidedly tinged with smoky brown, and the spots of the wing-coverts almost absent. The Queen Charlotte Island Woodpecker *Dryobates villosus picoideus* occupies the islands of that name, and is a darker and still more smoky bird than *harrisi*. The Sitka Hairy Woodpecker *Dryobates villosus sitkensis* is the bird of the southeastern Alaskan coast, and perhaps northwestern British Columbia. In coloration, it is between *harrisi* and *monticola*.

Some of these subspecies are founded on average characters, and there are many intergrades, as would be expected from the many geographical contacts between them. The extremes of the white and smoky-breasted types are very distinct.

The Hairy Woodpecker gets its name from the white feathers of the back, which fall over the black borders in a loose, disconnected way faintly suggestive of hair. It is one of the common Woodpeckers and quite typical of the family in its habits. It is not as familiar about houses or orchards as the Downy Woodpecker, preferring the woods to orchards or shade trees.

Economic Status. Insects constitute 77 per cent of the food of this species; they are mostly beetles, but include ants, scales, and sawflies; 22 per cent is vegetable, almost entirely wild fruit.

394. **Downy Woodpecker** (Including **Nelson's, Batchelder's, Gairdner's,** and **Valdez Downy Woodpeckers**). *Dryobates pubescens.* L, 6·83. Plate XXXIV A. A very small, black and white Woodpecker, the only other colour on it is in the small, bright red nape bar on the male. Hardly distinguishable in colour from the Hairy (*See* Plate XXXIII B). In the far west, the whites may be lightly, to heavily, tinged with smoky brown.

Distinctions. With its sharply contrasted black and white, or black and smoky white, to be confused only with its larger relative, the Hairy Woodpecker, which parallels it in all plumages. The principal difference, besides size, is in the outer tail feathers, which are barred with black instead of being solid white (Compare with Figure 241 b).

Field Marks. Black and white, or black and smoky white coloration. Many white spots. Separated from the Hairy Woodpecker by smaller size.

Nesting. In holes drilled in trees.

Distribution. All wooded parts of North America, but not quite as northern in extreme range as the Hairy Woodpecker. In Canada, most of the wooded areas across the continent.

SUBSPECIES. Divided into a number of geographical races. Of these, the following are accredited to Canada. The Eastern Downy Woodpecker *Dryobates pubescens medianus*, that occupies most of eastern North America, extends west throughout the Dakotas, and is probably the bird of the southern Prairie Provinces. The Northern or Nelson's, Downy Woodpecker *Dryobates pubescens nelsoni* is very slightly larger, and with a whiter breast and less barring on outer tail feathers. It can be expected to blend into *medianus* in the Prairie Provinces, and extends northwestward through Mackenzie, northern

British Columbia, Yukon, and the interior of Alaska. In southern British Columbia, east of the Coast range, is Batchelder's Woodpecker *Dryobates pubescens homorus*, of the size of *nelsoni*, but with little white on the wing-coverts, analogous to *monticola* in the Hairy Woodpecker. This race extends southward through the United States interior to New Mexico. On the coast, west of the Coast and Cascade ranges, is Gairdner's Woodpecker *Dryobates pubescens gairdneri*, extending southward to northern California. It has the whites tinged with smoky similarly to *harrisi* of the Hairy Woodpeckers. On the Alaskan coast, from Kenai peninsula to northern British Columbia, is the Valdez Downy Woodpecker *Dryobates pubescens glacialis*, in size intermediate between *nelsoni* and *medianus*, and with a slightly different distribution of white on the wings and coverts.

With the exception of the deeply coloured Gairdner's Woodpecker, these are all very slightly defined races, founded on more or less average characteristics, and naturally intergrade with each other along the lines of contact. Their boundaries have not been very well established in Canada.

The Downy Woodpecker shows an interesting case of parallel development with the Hairy, of which it is little more than a small replica. It breaks up into geographical races closely resembling those of that species. Thus we have the following analogous races, showing practically similar characters:

Eastern Hairy	Eastern Downy	Smaller
Northern Hairy	Northern Downy	Larger
Rocky Mountain Hairy	Batchelder's	Large and spots reduced
Harris'	Gairdner's	Smoky

The Downy, over most of its range, is one of the commoner Woodpeckers. It is more likely to come into the orchard and parks, and closer to the house, than is the Hairy. It is a valuable assistant to the husbandman, the orchardist, and the forester.

Economic Status. Being the most fearless of the Woodpeckers and coming close about the fields and houses where it is most needed, it is an invaluable bird. Peering into every crack and crevice of shade and fruit trees and drilling for deeper-lying insects it well complements the work of the little Chickadee and Nuthatch. In fact, these three species often travel in company in the winter and there is little in the food line that is overlooked when the three species work together. The food of the Downy Woodpecker is similar to that of the Hairy Woodpecker, but, as would be expected from its smaller size and its more common presence in summer, includes more of the smaller insects. The various scale-insects make a larger item in its food and it takes more moth-caterpillars, including the tent caterpillar and those of the codling moth.

399. **White-headed Woodpecker.** *Xenopicus albolarvatus.* L, 8·90. Male: all black, except for white head, neck, patch on wing, and a red bar across nape. Female, similar, but without red bar.

Distinction. With above description, can be mistaken for no other species. The female Williamson's Sapsucker may have a whitish head, but her body, sharply barred with black and white, is quite different.

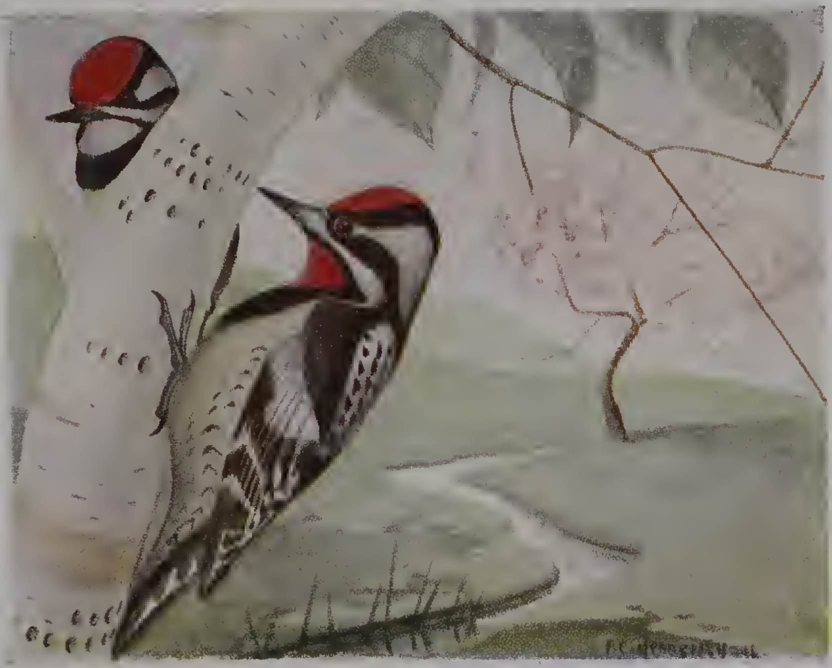
Field Marks. A black Woodpecker, with white head and wing patch.

Nesting. In a hole in a stub.

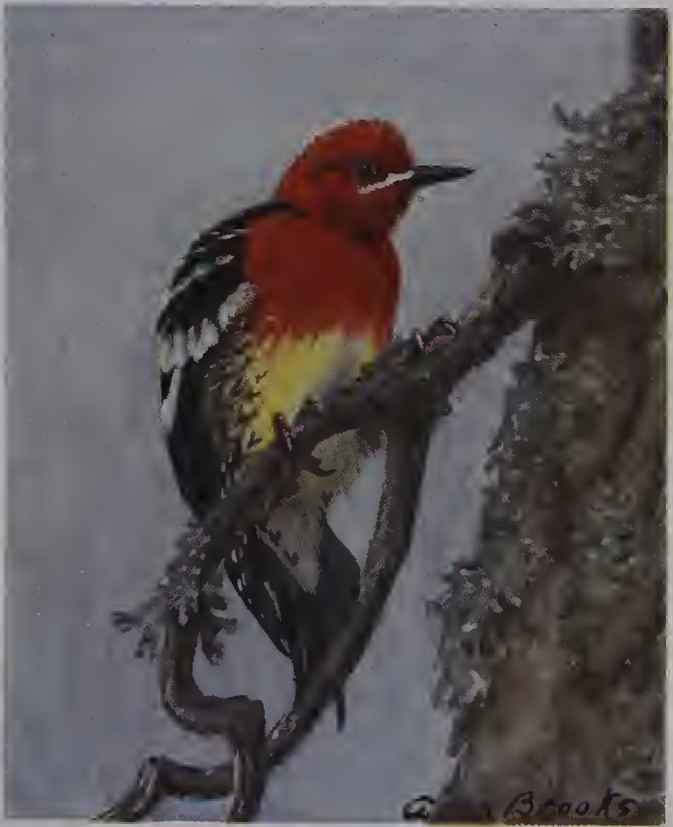
Distribution. In mountains from Washington to southern California. Occasional in southern British Columbia. Only three Canadian specimens known, from the Similkameen and Okanagan valleys.

SUBSPECIES. The form to be expected in Canada is the northern, or type race, *Xenopicus albolarvatus albolarvatus.* Only an occasional wanderer across our far southwestern borders.

PLATE XXXV



A. Yellow-bellied Sapsucker; scale, $\frac{1}{3}$
Female
Male



B. Red-breasted Sapsucker; scale, $\frac{1}{3}$

400. **Arctic Three-toed Woodpecker.** BLACK-BACKED WOODPECKER. *Picoides arcticus.* L, 9·50. Plate XXXIV B. A Woodpecker with three, instead of four, toes (Figure 241 c), and a solidly black back; male with a yellow crown cap.

Distinctions. With three, instead of four, toes, likely to be confused only with the next species. The back is solid black, however, instead of brokenly barred with white.

Field Marks. The yellow cap will identify the male as a Three-toed Woodpecker. This is the only Woodpecker with white breast and solidly black back.

Distribution. The northern coniferous forests across the continent, southward in the mountains.

401. **American Three-toed Woodpecker** (Including **Eastern** and **Alaska Three-toed Woodpeckers**). LADDER-BACKED WOODPECKER. *Picoides americanus.* L, 8·75. A Woodpecker with three, instead of four, toes (Figure 241 c). Back, black with broken white bars, and male with yellow crown cap.

Distinctions. Except for the banded, instead of solid black, back, almost exactly similar to the Arctic Three-toed Woodpecker, which is the species most likely to be confused with it (compare with Plate XXXIV B).

Field Marks. The yellow cap will identify the male as a Three-toed Woodpecker, and the barring of the back will indicate this species. Much like a Hairy Woodpecker, but back barred with white, instead of a longitudinal mass of that colour; flanks also heavily barred with black. The female Williamson's Sapsucker also has a barred back, but the barring is not confined to the centre of the back, and the crown is never black.

Nesting. In holes excavated in tree trunks, often living ones.

Distribution. The northern coniferous forests of North America, southward along the mountains to New Mexico.

SUBSPECIES. Several subspecies are accepted. Of these, two occur in Canada. The Eastern American Three-toed Woodpecker extends west to Alberta, where its place is taken by the Alaskan Three-toed Woodpecker *Picoides americanus fasciatus*, characterized principally by more white on back.

The Three-toed Woodpeckers are typically north woods birds, and in summer come south only in the higher altitudes of the mountains. In the winter they may occur in migration in the foothills on the prairies in suitable localities.

SAPSUCKERS

The Sapsuckers form a group of Woodpeckers that are adapted for drinking sap rather than boring for grubs. In consequence the tongues are short and modified at the end into a sort of brush (Figure 241 e), instead of into a sharp, barbed spear. The remarks made under heading of Yellow-bellied Sapsucker are largely true of the two other species dealt with here.

402. **Yellow-bellied Sapsucker** (Including **Eastern** and **Red-naped Sapsuckers**). *Sphyrapicus varius.* L, 8·56. Plate XXXV A. Variegated above with black and white without sharp contrast or very definite pattern; below, strongly tinged with yellow and a strong black crescentic gorget across the breast. Male with crimson crown and throat; female the same, or with dull white throat and, occasionally, with black cap. Juveniles lack the red crown and throat, and the black gorget, the whites are tinged with ochre and the breast is dull, dirty brown.

Distinctions. To be mistaken only for the Red-breasted Sapsucker of the west coast, which is similar in general coloration, but which has head, neck, and throat a solid crimson which is suggested even in juvenile birds.

Field Marks. The red cap and throat are conspicuous in life. When these are absent, the black gorget in the adult is usually distinctive. Otherwise, the indefinite black and white pattern, with a broad white bar on forward part of closed wing, make best field marks, but will not separate from the Red-breasted Sapsucker of the west coast. The rolling tattoo made by the Sapsucker in drilling is distinctive from that of the other Woodpeckers. It ends in four or five isolated taps with appreciable intervals between, instead of stopping abruptly as if in the middle of the roll.

Nesting. In holes excavated in dead trees and stubs.

Distribution. Northern North America, except Yukon, Alaska, and west of the Coast range, from tree limits southward.

SUBSPECIES. The Eastern Yellow-bellied Sapsucker *Sphyrapicus varius varius* inhabits the wooded sections of the Dominion, west to the Rocky mountains, and into northern British Columbia. The Red-naped Sapsucker *Sphyrapicus varius nuchalis* occupies British Columbia, except in the north, and on the coast, south to New Mexico, overlapping the range of *varius* in western Alberta. It differs from *varius* principally in having a red bar across the nape, separated from the red crown by a black line. The female has a red throat, which the female of *varius* never has.

Economic Status. This is the only Canadian genus of the family that seems to be harmful. The damage is done in quest of sap, by girdling the trunks and branches of orchard and other smooth-bark trees with rows of small squarish pits, regularly spaced in horizontal lines penetrating both outer and inner barks to the sap-wood beneath. Several trees may be so tapped and visited in turn as the sap exudes. Though it is primarily the sap which is sought, the insects attracted are also eaten, for though sap is a large item in the Sapsucker's diet, insect food is also necessary.

Although the damage to trees so girdled is not nearly so great as might be expected, they are sometimes permanently injured and even killed. All are weakened and a lodgment prepared for fungoid growth and insects. Unless severely and repeatedly attacked, however, most trees survive and completely recover. Even forest growth suffers damage; timber trees are attacked and the consequent burr growths and wood stains in the manufactured lumber, marking the old, healed wounds made by the Sapsucker, reduce the marketable value of the lumber products. The whole question of the damage done by Sapsuckers has been exhaustively discussed in a United States Biological Survey Bulletin, No. 39, "Woodpeckers in Relation to Trees and Wood Products," by W. L. McAtee. Under the heading of defensive measures against Sapsuckers the author advises a limited use of the gun or the use of poison where the species is doing appreciable harm. If the gun is used care should be taken that only Sapsuckers are killed and it must be remembered that with poison, other small birds, especially Hummingbirds, Warblers, and other species that are often attracted in great numbers to the sweet, oozing sap, are likely to suffer also.

403. **Red-breasted Sapsucker** (Including **Northern Red-breasted Sapsucker**). *Sphyrapicus ruber.* L, 8·50. Plate XXXV B. In general, similar to the Yellow-bellied Sapsucker, but with less fine white markings on back and wings, and with a bright crimson head, neck, and breast. Sexes alike. Juveniles similar to those of the Yellow-bellied, but darker and usually with suggestive suffusions of red on head and breast.

Distinctions. To be confused only with the Yellow-bellied Sapsucker, but confined to the vicinity of the west coast. Easily differentiated by extensive red head, neck, and breast, suggested even in juvenile birds.

Field Marks. Extensive red head, neck, and breast. The indefinite black and white coloration with broad white bar on forward part of closed wings will separate from all species but the Yellow-bellied Sapsucker.

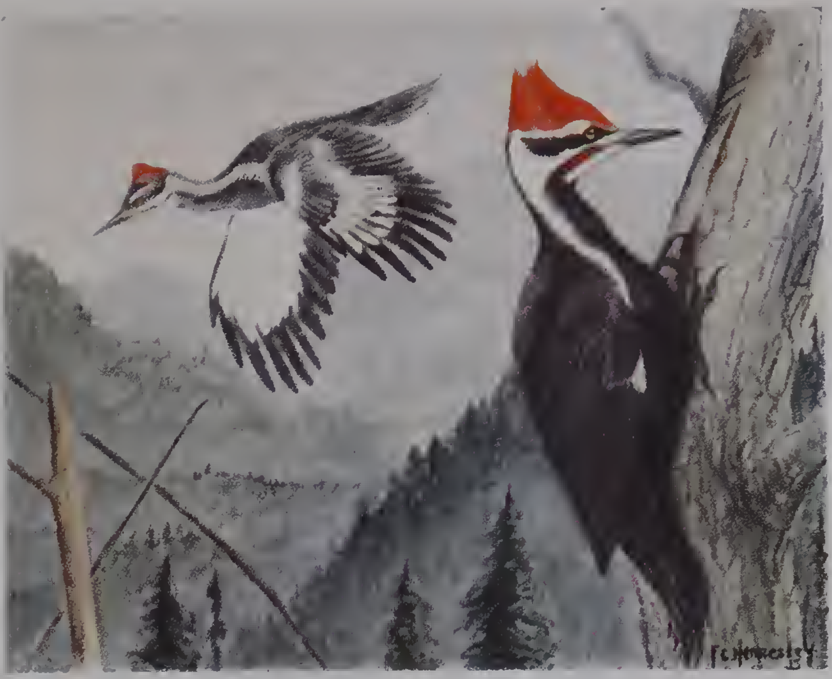
Nesting. In holes excavated in dead or living trees or stubs.

Distribution. Western North America, mainly west of Coast and Cascade ranges.

SUBSPECIES. The Red-breasted Sapsucker is divided into northern and southern races. The Northern, *Sphyrapicus ruber notkensis*, ranges from Skagway, Alaska, to northern California. In British Columbia, mostly west of the Coast range, but spreading into the interior near the northern extremity of its range.

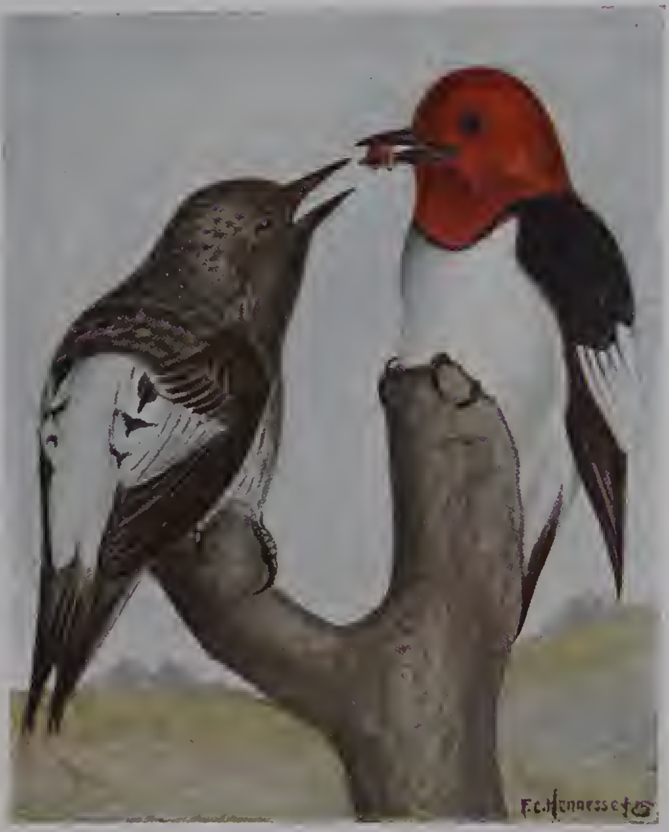
The Red-breasted Sapsucker does not differ materially in habits or economical effect from the Yellow-bellied.

PLATE XXXVI



A. Pileated Woodpecker; scale, $\frac{1}{7}$

Female Male



B. Red-headed Woodpecker; scale, $\frac{1}{4}$

Juvenile Adult

404. **Williamson's Sapsucker.** CUT-THROAT SAPSUCKER. *Sphyrapicus thyroideus.* L, 9·50. The male is a very distinctive bird. The species is notable for the extraordinary sexual difference in coloration. Male: solid black, except white rump, wing-covert patch, and two sharp lines on face; abdomen sharply defined lemon yellow, and a narrow, blood-red dash on the centre of the throat down from bill. Female: back, wings, and flanks regularly and sharply barred with narrow lines of black and white, having an appearance of being wound around with black and white worsted; black breast and throat patch, and yellow abdominal patch. Head mostly dull white or dirty brown. The black breast patch may be absent, and there may be indications of the red dash on the throat.

Distinctions. Unmistakable for any other species. The solidly black back, with contrasting white rump of the male, and the regular barring of the back of the female, are distinctive.

Field Marks. The general blackness of the male, with conspicuous white wing patch and rump, and the barred back and white rump of the female make good field marks. The female is strongly suggestive of a Flicker, especially in flight, when the white rump shows.

Nesting. In holes excavated in trees and stubs.

Distribution. The western mountain forests of North America, from southern British Columbia to New Mexico. Range very local and restricted in Canada. Recorded only from some of the higher tamarack forests near the southern boundary, from Okanagan valley to the Alberta line.

Too rare in Canada, and so confined to the wilder elevations as to have little economic influence.

405. **Pileated Woodpecker** (Including **Northern** and **Western Pileated Woodpeckers**). COCK-OF-THE-WOODS. LOG-COCK (incorrectly, WOODCOCK). *Phloeotomus pileatus.* L, 17. Plate XXXVI A. A very large Woodpecker, coloured in broad masses of black and white and with a conspicuous, pointed, brilliant red crest.

Distinctions. By far the largest Woodpecker in Canada, it can be confused with no other Canadian species.

Field Marks. A Woodpecker almost as large as a Crow, with striking, pointed red crest, and loud, characteristic cries.

Nesting. In holes excavated in dead trees and stubs.

Distribution. The northern forests across the continent, south along the mountains.

SUBSPECIES. Four subspecies of the Pileated Woodpecker are recognized in the Check-list, two of which are accredited to Canada. The Northern Pileated Woodpecker *Phloeotomus pileatus abieticola* is the form of eastern Canada, extending west. The Western Pileated *Phloeotomus pileatus picinus* is accredited to the west coast mountains, Alberta, and probably farther east. It is described as being slightly smaller and darker (browner), with the whites restricted. These distinctions are very slight, however, and are average rather than individual.

In the east, on account of the wanton destruction, this once much more widely distributed bird is to be found only in the quiet of the more northern woods. Even there, visitors and deer hunters could not resist the temptation of taking so spectacular a trophy home with them, and it was being rapidly reduced in number until the provisions of the Migratory Birds Convention Act extended practical protection over it. In the west, things have not gone so far, and, especially in the mountain and coast districts, it may still be seen in close proximity to civilization. It is a bird typical of the deep woods. It visits the rotten logs in the damp, shadowy undergrowth, and, with its powerful bill, tears and scatters them about in fragments for the grubs contained. These habits are the origin of the common vernacular names, Cock of the Woods and Log-cock, which have often been corrupted into Woodcock, a name already applied to an entirely different bird, and the source of much confusion and misunderstanding. Its principal value is that of a forest conserver, and it should be protected for economic as well as aesthetic reasons.

406. **Red-headed Woodpecker.** *Melanerpes erythrocephalus.* L, 9·75. Plate XXXVI B. Solidly black above, with secondaries and rump pure white; head, neck, and upper breast bright crimson red; below, white. The juvenile has the red of head and neck replaced by dusky ash, and the blacks and whites edged and obscured with the same.

Distinctions. The solid red head and the conspicuous black and white in large, unbroken masses, can be mistaken for no other species.

Field Marks. The red head and contrasting masses of black and white on the body, especially the large amount of white in the wings.

Nesting. In cavity excavated in dead tree or stub.

Distribution. Most of eastern and central North America, from southern Canada, south to the gulf of Mexico. In western Canada, along the southern border as far west as Alberta.

SUBSPECIES. Birds from the western prairies are somewhat larger than eastern ones, and have been described as a separate subspecies, the Western Redheaded Woodpecker *Melanerpes erythrocephalus erythrocephalus*, but the form has not, as yet, been recognized by the American Ornithologists' Union Committee. The author is unable to say which form is represented in Manitoba.

The Red-headed Woodpecker is not common enough in western Canada to be of much economic importance.

408. **Lewis's Woodpecker.** *Asyndesmus lewisi.* L, 10·50. Plate XXXVII A. A solidly black-backed Woodpecker. Abdomen an intimate mixture of rose and grey (mostly rose) with peculiar hairy effect; breast of similar texture, but grey, and continuing about neck in a narrow collar. Face and chin dull, dark crimson. Juvenile similar but without red face or grey collar, and the rose below, duller.

Distinctions. The solid black back, grey collar and breast, and peculiar streaky rose underparts can be mistaken for no other bird likely to occur in Canada.

Field Marks. All black back and rose underparts, with characteristic flycatching habits.

Nesting. In holes excavated in trees and stubs.

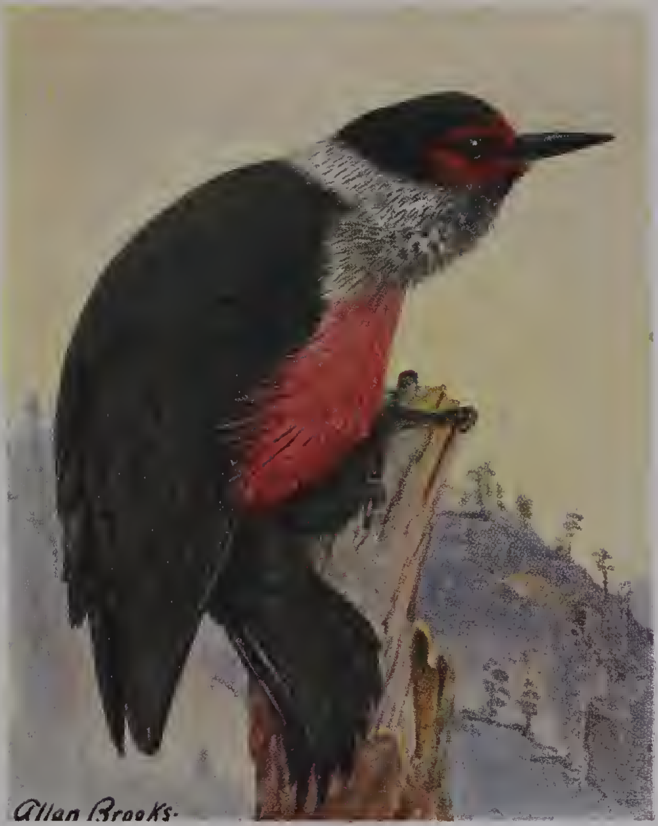
Distribution. Western north America, from southern British Columbia, south to New Mexico. In Canada, mostly west of the Rocky mountains, but occasional as far east as Saskatchewan.

Lewis's Woodpecker is a conspicuous bird in southern British Columbia. Its habit of frequenting the tops of tall, isolated trees, and flying out from them, making short circles and returning, or passing back and forth between adjoining trees, well out in the open, would attract attention at once, even if the birds were not so noisy. The shiny black backs and rosy underparts enhance their ornamental value.

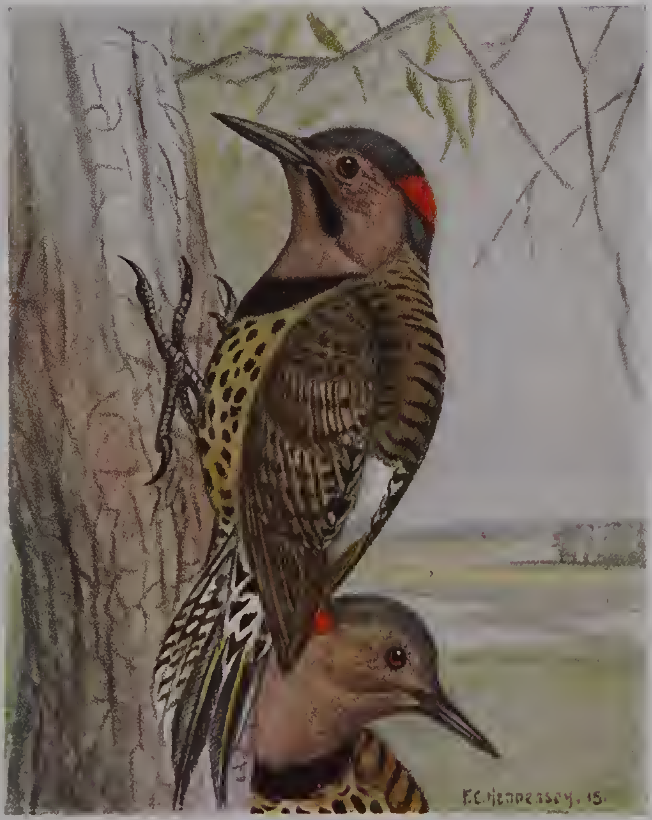
Economic Status. There are strong, and at least partly, substantiated complaints against them as fruit-eaters. When they confine their attention to wild varieties, no harm is done, but they take cultivated varieties, and may on occasion cause some loss where fruit-raising is an important industry. No complete study of their food habits has been made, but such evidence as we have indicates that the bird on the whole, and throughout the year, is largely insectivorous. It does not delve into wood for grubs as much as other Woodpeckers do, but takes a considerable number of beetles, ants, and other hymenoptera, a few bugs, and some grasshoppers. Normally, about 15 per cent of the total food supply is fruit. Though undoubtedly too many fruiteating birds in a fruit-growing district is a handicap, the species is never anything more than a local problem, and further investigation in field and laboratory is necessary to fix its definite economic status.

412. **Flicker** (Including **Boreal Flicker**). YELLOW-HAMMER. HIGHHOLE. GOLDEN-WINGED WOODPECKER. *Colaptes auratus.* L, 12. Plate XXXVII B. Greyish fawn on back, with broken bars of black; vinaceous face and throat fading to white below; light underparts

PLATE XXXVII


Allan Brooks.

A. Lewis's Woodpecker; scale, $\frac{1}{3}$


F.C. Hennessey. 15.

B. Yellow-shafted Flicker; scale, $\frac{1}{4}$

Male

Female

and flanks, with many sharp, round, black spots; a black gorget across breast; crown slate grey with red bar across nape. Male with black moustache mark from gape. Undersurface and shafts of flight and tail feathers in all plumages brilliant yellow; rump, white.

Distinctions. Unmistakable for any other species except the Red-shafted Flicker, which differs in having a grey instead of vinaceous throat and face, a red instead of black moustache mark, and the yellow of wings and tail replaced by pinkish red. These two species hybridize extensively and all sorts of mixtures of characters may be found. A tint of grey in throat or face, tinge of red in the under-wing or tail surface, or specks of red in the moustache, are indicative of mixed blood.

Field Marks. Size, general coloration with yellow under the wings visible in flight, and the white rump. Easily recognizable calls.

Nesting. In hole in dead tree or stub.

Distribution. Eastern North America from tree limit in the north, to the Gulf coast. In Canada, west to the Rocky mountains, and northwest to Alaska. In British Columbia, and adjacent Alberta, it intermixes and hybridizes freely with the Red-shafted Flicker.

SUBSPECIES. The Yellow-shafted Flicker now attributed to Canada is the Boreal Flicker *Colaptes auratus borealis*, that extends into the north-central United States.

The Flicker is perhaps the Woodpecker most familiar to the general public. Its loud, characteristic notes of "*Flicker-flicker-flicker*", or long-drawn "*Piew-w-w-w*", are well known and easily recognizable sounds. It has a habit of clinging to some hollow-sounding tree trunk and rolling out a long, reverberating tattoo that can be heard for long distances. It sometimes uses a loose shingle or clapboard of a house or galvanized sheet as a drum or sounding board and delights itself with the increased efficiency of its efforts, often to the disturbance of others.

Though a somewhat aberrant Woodpecker in habits, and less dependent on tree borers than many of the family, its summer range is strictly confined to localities where there is timber of sufficient size to be excavated for nesting holes. Consequently, in the great area of the bare prairies, the species is only an occasional visitor, but every wooded coulée is frequented by it, and it has found that the telegraph poles strung across the open are most excellent artificial stubs, and its range has been considerably increased by the building of telegraph and telephone lines.

The Flicker is the carpenter of the bird world, and, without it, it is questionable where many cavity nesting species, that are unable to do their own excavating, would find quarters. Sparrow-hawks, Bluebirds, Tree Swallows, small Owls, and many other species are almost entirely dependent on the Flicker for nest holes. The reproductive powers of the Flicker are phenomenal. When eggs were taken away as they were laid, it has been known to lay thirty or more eggs in a season.

The relation of this species to the Red-shafted Flicker is most interesting. It intermixes and crosses freely with that species and, near the line of contact between them, it is unusual to find pure-blooded birds of either species. That the two are distinct species and not subspecies is indicated by the nature of the intergrading specimens. The characters are not gradual blendings but mosaic mixtures. Thus the moustache mark is very seldom brown, which would be the result of blending between the black of the Yellow-shafted and the red of the Red-shafted, but it is pure black, pure red, black flecked with red, or vice versa. The same phenomenon is shown in the throat plumage, in which the feathers may be alternately grey and vinaceous, or one colour at the base and another at the tip; or even a difference between one barbule and the next. The underwing and undertail surface may be orange, which is a blending between the yellow and red. This is not necessarily contrary to the rule of mosaic mixture in hybrids, because these two colour pigments in bird plumage are intimately related, chemically and physiologically, and may, perhaps, be regarded as one and the same substance in different concentration. The fact that, in spite of the readiness with which these two species cross, both species are not completely mongrelized, is suggestive that such hybrids have some handicap against indefinite persistence, and are continued only through constant fresh crosses of purer blood.

Economic Status. Ants constitute nearly half the food of the Flicker. The remainder of its insect food consists of both beneficial and harmful species, but the latter noticeably predominate. It takes some fruit, grain, and mast; but on the whole must be considered beneficial rather than harmful. Perhaps the most serious charge that can be made against the species is its scattering of the seeds of the poison oak and ivy and so aiding in the spread of these harmful plants.

413. **Red-shafted Flicker** (Including **Northwestern Flicker**). *Colaptes cafer.* L, 12. Similar to the Yellow-shafted Flicker, but the face and throat slate grey, instead of vinaceous; red moustache mark, instead of black; normally with no red on nape, the lining of wings and tail pinkish-red, instead of bright yellow.

Distinctions. To be confused only with the Yellow-shafted Flicker from which it differs as above.

Field Marks. Size, general coloration, with red under the wings visible in flight, and the white rump. As a Flicker, by its easily recognizable calls.

Nesting. In holes in dead trees or stubs.

Distribution. Western North America from southern Alaska to Mexico. In Canada, southern and central British Columbia, intermixing and hybridizing with the Yellow-shafted over much of its range, and well into adjacent Alberta. Specimens with strong Red-shafted tendencies have been taken as far east as Manitoba.

SUBSPECIES. Owing to a late and interesting relocation of stations visited by Captain Cook, the navigator, it has lately been discovered that the specimen that first received the name of *cafer* came from Vancouver island, and hence our British Columbia coast bird, the Northwestern Flicker, hitherto known as *Colaptes cafer saturatior*, is the type of the species and should be called *Colaptes cafer cafer.* It occupies the Pacific Coast region west of the Coast range from Sitka to northern California. It is characterized by being generally darker coloured than the Red-shafted Flicker of the interior, *Colaptes cafer collaris.*

Everything said of the Yellow-shafted Flicker (*See* page 233) applies to this species.

Order—Macrochires. Goatsuckers, Swifts, and Hummingbirds

In this order are grouped a number of birds that after further investigation may be rearranged. The present classification of the American Ornithologists' Union is avowedly tentative and adhered to only until a permanent system can be agreed upon. The various suborders of the division are more easily recognized by their differences than by their agreements, and those points in which they differ will be emphasized in the following descriptions.

SUBORDER—CAPRIMULGI. GOATSUCKERS

This is a widely distributed suborder divided into a number of families. A description of the one family represented in North America will serve for the recognition of the native species.

FAMILY—CAPRIMULGIDAE. GOATSUCKERS.

General Description. The Goatsuckers have flattened heads, very small bills, and enormous mouths, with gape extending to behind the eye (Figure 242). The feet are small and very weak and the middle claw pectinated or furnished with comb-like serrations as in the Herons (Figure 243). The plumage is very soft in texture and coloured in wood-browns, neutral buffs, and greys.

Distinctions. The above characters should be sufficient to distinguish this family as they are not similar to those of any other Canadian birds.

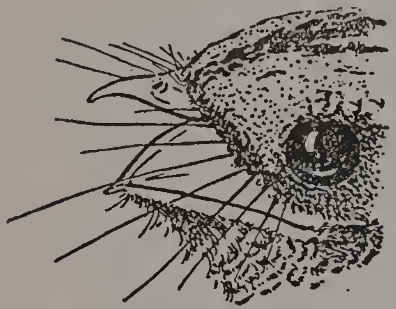


Figure 242
Bill and mouth of Whip-poor-will.

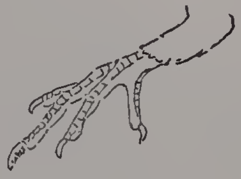


Figure 243
Foot of Whip-poor-will; scale, about $\frac{2}{3}$.

The Goatsuckers were given their name from an old but mistaken belief that they sucked the milk from the goats in the pastures over which they were seen to wheel and circle, and their immense mouths and pink throats gave support to the popular impression. As a fact the birds that frequented the pastures were hawking for flying insects that had been attracted by the animals. The birds of this family are nocturnal or crepuscular. They feed entirely upon insects caught on the wing and seldom come to ground except to nest or for repose. Their feet are too small and weak to clasp a branch securely and in perching they usually sit on large branches, lengthwise instead of—as do most birds—crosswise.

417. **Whip-poor-will.** *Antrostomus vociferus.* L, 9·75. Coloured in soft indefinite patterns of wood-browns and grey with suggestions of rufous and ochre. There is little broad pattern in the colouring, but much fine detail. On the underparts there is only a faint suggestion of barring, and the coloration of the whole bird is like that of a great brown moth.

Distinctions. With its small bill, enormous gape, long mouth bristles (Figure 242) and soft, wood-brown coloration, possible of confusion only with the Nighthawk. It is easily distinguished from that species by the following points: there is a white collar across the base of the throat, but the throat itself is dark; the last half of the tail feathers, except of the middle pair, is white in the male, and tipped with buffy in the female; the spread wing shows no white spot. Because of its eastern range, large size, and very much longer tail, not likely to be confused with the western Poor-will that resembles it closely in coloration and habit.

Field Marks. A wood-brown, long-winged, long-tailed bird, with no conspicuous white spot in the wing, that rises from the undergrowth with a loose floppy flight, flies low, and soon alights again on the ground beyond. More often recognized by sound at night than by sight in the day. Its call at night, a soft whistle resembling the words *"Whip poor will"* repeated many times, is familiar to all frequenters of the eastern woodlands.

Nesting. Eggs laid directly on the ground or on dead leaves.

Distribution. Eastern North America. In Canada, west to and including the woods and bluffs of southern Manitoba. Has been taken as far west as Prince Rupert, Saskatchewan.

SUBSPECIES. The subspecies accredited to Canada is the Northern one *Antrostomus vociferus vociferus.*

There is no other sound in the Canadian woods so poetically mournful as the reiterated call of the Whip-poor-will. The translation of bird notes into words usually requires a stretch of the imagination, but this bird says *"Whip-poor-will, whip-poor-will"* with unusual distinctness. For a calling station it selects a perch on a fallen tree trunk, a bare branch, the roof of a building, or even a tent-pole. It returns to its various stations regularly on successive nights and seems to visit each in turn. Between periods of calling the bird hawks and wheels through the tree tops in large interlacing circles, sometimes swooping towards the ground in a long pendulum-like swing. In the daytime it seeks the ground in some quiet patch of underbrush where it passes the time at rest. When disturbed by an intruder it rises with a loose, poorly controlled flight that gives no indication of its wonderful command of the air at other times, flutters a short distance over the tangle, and drops again to earth.

The Whip-poor-will is often regarded as identical with the Nighthawk. This is a not unnatural mistake when they are not seen side by side, as they are quite similar enough to be confused.

Economic Status. The Whip-poor-will feeds largely upon night-flying beetles, especially May beetles or June bugs.

418. **Poor-will.** *Phalaenoptilus nuttalli.* L, 7·50. Above: a rich, dark, seal-brown, frosted over with a fine complicated pattern of silver-grey. Below: the same colours, but the breast predominantly dark; the flanks and abdomen finally barred with silver and predominantly light, the bars dying away on the breast. A triangular white patch occupies the throat. Tail rounded, under 3·50 inches, and the three outer feathers tipped with white thumbmarks.

Distinctions. Much like a small, short-tailed Whip-poor-will, but far removed from that species in range. Likely to be confused only with the Nighthawk, the only other Goatsucker that is found in the same locality with it. Differs from that species in being smaller, having a shorter, round tail with outer feathers white tipped. The white throat patch does not reach the base of the bill, and there is no white spot in the outspread wing. The mouth is furnished with bristles, as in Figure 242.

Field Marks. A woody-brown bird that is occasionally flushed just in front of the feet from the shade of a sage-brush or rock on the bare mountain benches, flops away over the open, and then drops suddenly. More often heard at night than seen by day. Its note, a soft, hollow-sounding, three-syllabled whistle resembling "*Cook – – Wid–ow,*" many times repeated. Sometimes the first word is omitted, and when very close to an agitated bird, a number of little clucks may be heard as it sails noiselessly about the intruder.

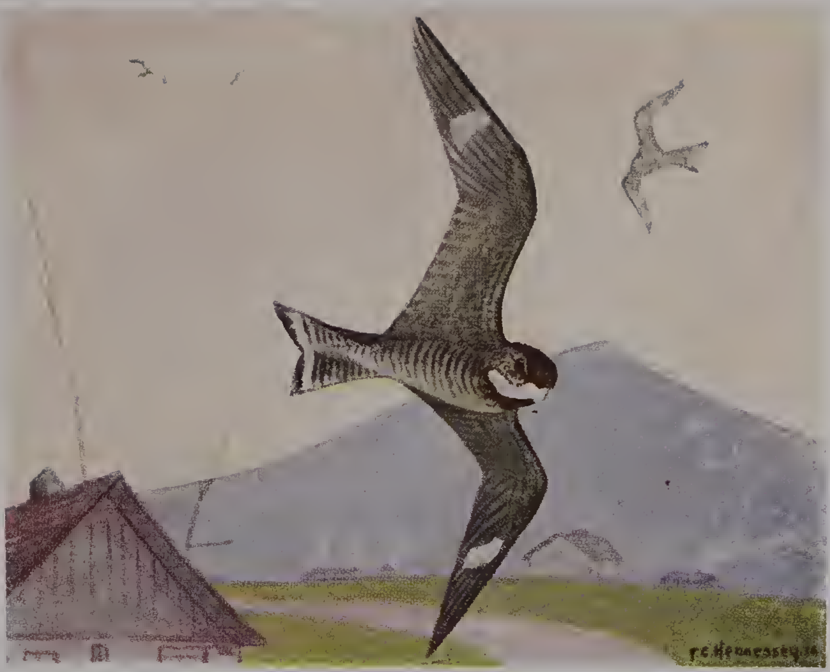
Nesting. Eggs deposited on the bare ground.

Distribution. Central and western North America. In Canada, only in the valleys of southern interior British Columbia.

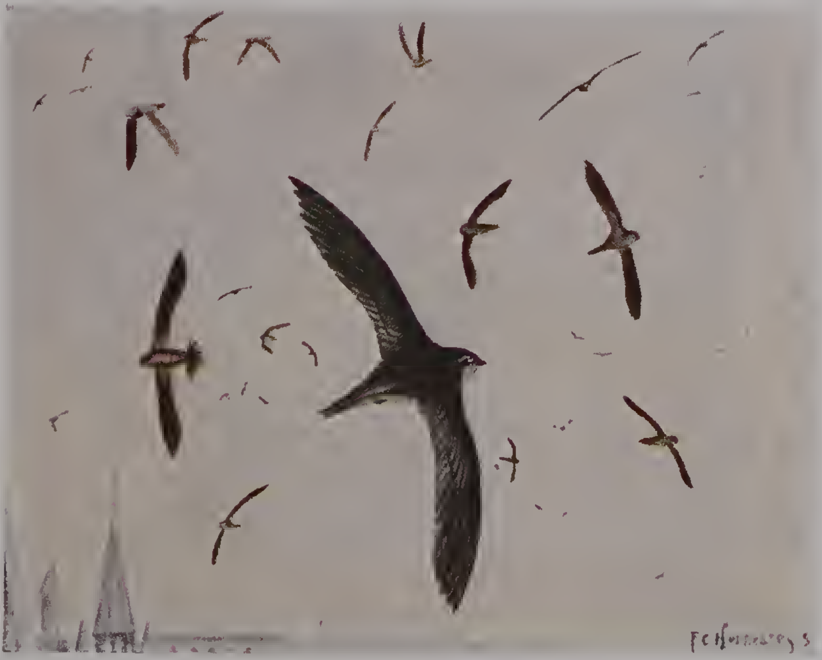
SUBSPECIES. Of the three subspecies recognized in the Check-list only one, the Northern Poor-will *Phalaenoptilus nuttalli nuttalli,* is accredited to Canada.

This soft, moth-like, nocturnal frequenter of the lower mountain benches and sage-covered flats of the warm, arid valleys, is the western representative of the eastern Whip-poor-will. Though it is a bird of the open rather than the forest, it is similar to the Whip-poor-will in general appearance and habit. The day is spent dozing in the sultry shade of some small bush or stone with its great eyes half shut, its mottled and frosted plumage blending into the background. In the cool of the evening it wakens, and all through the night, between sallies after insects, it reiterates its soft, far-carrying plaint from the small eminence of log, stump, or stone. The notes are much like those of the Whip-poor-will, but shorter. They are soothing and rich with mystery and probably to the majority of hearers their author remains unseen and unknown. An imitation of its call is not difficult, and will bring it close, and it can be lured for long distances

PLATE XXXVIII



A. Nighthawk; scale, $\frac{1}{8}$



B. Chimney Swift; scale, $\frac{1}{7}$

along the trail by crafty repetition. The first word "*Cook*" should be spoken and whistled in a deep tone, followed by two short notes of similar pitch and timbre with a strong accent on the first—"*Cook - - - oo-oo.*"

Economic Status. Undoubtedly similar to the Whip-poor-will, its food being night-flying moths, beetles, and other insects.

420. **Nighthawk** (Including **Pacific** and **Sennett's Nighthawks**). MOSQUITO HAWK, BULL-BAT, NIGHT-JAR. *Chordeiles virginianus.* L, 10. Plate XXXVIII A. A long-winged, long-tailed bird with the big eyes, small bill, and enormous gape of the Goatsuckers (Figure 242), coloured in fine and rather indefinite pattern of rich, dark brown and frosty white and greys.

Distinctions. The size of, and very similar to, the Whip-poor-will, for which it is often mistaken. Easily distinguished from it by the following characters. The throat is white, instead of being dark with white collar, the long mouth bristles are lacking (compare with Figure 242). The tail is slightly forked instead of round and has little white, except a narrow, broken subterminal bar. The underparts are distinctly barred and the wings have a prominent white spot at the base of the primaries. In the southern valleys of interior British Columbia to be confused only with the Poor-will, but much larger, the tail slightly forked and well over 3·50 inches long, with a white subterminal bar instead of small thumbmarks on tips. The chin and throat are white instead of dark. The barring below is more decided, and the white spot at the base of the primaries is very distinctive.

Field Marks. The Nighthawk often flies about in broad daylight, but the Whip-poor-will or the Poor-will never do so unless disturbed. A white spot on the wing shows very plainly in flight, resembling from a little distance the clear-cut hole made by a rifle ball. The wing action, and outline, as the bird flies about the upper air with long irregular stroke, are very characteristic, and its often-repeated, harsh, squawk-like note and its sudden, perpendicular dive in the air accompanied by a hollow booming sound are very distinctive of the species.

Nesting. Eggs laid directly on the ground in a clear spot, often the bald top of a flat rock. Flat gravel roofs in our cities are admirably adapted to its purpose and much used.

Distribution. North and South America. In Canada, north to Yukon and Mackenzie.

SUBSPECIES. Of the four subspecies recognized in the Check-list, three are attributed to Canada. The Eastern Nighthawk *Chordeiles virginianus virginianus* extends over much the greater part of the Dominion. In extreme southern Alberta, and probably into adjacent Manitoba, and Saskatchewan, in the dry belt near the International border, is Sennett's Nighthawk *Chordeiles virginianus sennetti*, a pale, whitened form that ranges south to Nebraska. In southeastern British Columbia, south to northern California, is the Pacific Nighthawk *Chordeiles virginianus hesperis*, a darker but rather poorly-defined race.

Though called Nighthawk this bird has no relation to the *Raptores* in habit, structure, or outward appearance. Its large eyes directed slightly forward sometimes cause it to be mistaken by casual observers for an Owl. These graceful aeronauts may be seen over almost any city or town as evening draws on, beating about on long, strong wings with slow, powerful, but rather erratically-timed beats. At intervals one will mount in steep spirals higher and higher, and then face earthwards and come down nearly perpendicularly like a falling stone. As it falls a hollow dull tremolo buzz is heard. Just before the observer thinks the bird must dash to the ground it recovers itself and glides off safely to repeat the operation.

Its notes are not musical in themselves, but, by association, they seem fitting to hot summer sunsets, with black steeples, and factory smoke-stacks silhouetted against glowing skies. Often the last thing seen at night is its long-winged, gracefully beating form high in the upper air, still illuminated by the ruddy afterglow that has deserted the lower world, while the harsh squawking comes down softened and harmonized by distance.

Through the day time, the Nighthawk seeks such shade as may be available, but evidently coolness is not a necessity to it. The writer remembers one stifling day in the arid lands of southern Saskatchewan when although the breeze made by the travelling car struck like a furnace blast instead of giving refreshment, yet for some distance along the prairie road every fence-post had a dozing Nighthawk upon it, absorbing in sleepy content the intense heat of the mid-day sun that was shrivelling the surrounding vegetation.

Economic Status. Of few birds can more good or less harm be told than of the Nighthawk. Its food, wholly of insects, is taken on the wing, high in the air where many of the insects are mating and at a time when their destruction does the most good. It is a surprisingly small bird when stripped of its thick coat of soft feathers, but requires a great amount of food. A list of the species taken by it includes great numbers of ants, June bugs, squash beetles, chinch bugs, leaf-hoppers, and other obnoxious species. The habit, common in some places, of using this bird as a live target for gunners when practising, is inexcusable and those guilty of it should be rigorously prosecuted. It should be realized that every offence against the laws protecting insect-eating birds is something more than a technical offence against an impersonal state; it is a direct blow at the welfare of the whole community.

SUBORDER—CYPSELI. SWIFTS

A widely spread suborder consisting of one family.

FAMILY—MICROPODIDAE. SWIFTS

Mostly small birds in dull colours without much pattern or variegation. Usually, over-all colours of sooty or black. Bill very small with large gape. Feet weak and fleshy rather than scaled (Figure 244 a and b). In general, resembling Swallows, in detail more like the Goatsuckers, but without the finely patterned plumages, and the feathers hard and compact rather than soft and full. The primaries very long, bowed, and extending when closed far beyond the tail (Figure 244 d). It is a group of birds superficially resembling Swallows, but structurally quite different from them, the similarity being brought about by common requirements and not by relationship. The compactly, hard-feathered wings, the long, bowed primaries, short secondaries, and the peculiar wing action of the Swifts are different from those of the Swallows. The Swallow beats the air with long, rythmical strokes, the Swift buzzes through it like a beetle and then sails on stiff-set wings locked into an even bow (Figure 244 e). The Swallow glides up and down invisible aerial waves like a sailboat, the Swift bores through them like a torpedo. The Swifts are noted for the extraordinary development of the salivary glands that produce an abundant secretion with which the nest of sticks is cemented together and to its perpendicular support. It is this cement that forms the edible bird's nests of Chinese epicures.

The Swifts live entirely on insects, catching their food on the wing.

The North American Swifts are divided into two subfamilies.

Subfamily—Chaeturinae. Spine-tailed Swifts

Not all of this subfamily have spine-tails (Figure 244 c). Amongst the species herein treated, the Black and White-throated Swifts are without them. The tarsi and toes are never feathered, but are not as fleshy (Figure 244 b) as they are in the next subfamily. Canadian species except one are solidly coloured.

422. **Black Swift.** BLACK CLOUD SWIFT. *Cypseloides niger.* L, 6·75. The largest of our Swifts. Very dark sooty, almost black, but faintly lightening about head and breast, and with greyish feather edges on forehead and crown. Below, the female may or may not be marked with white feather tips.

Distinctions. Large size (wing over 6 inches), black coloration, and tail not spine-tipped (Compare Figure 244).

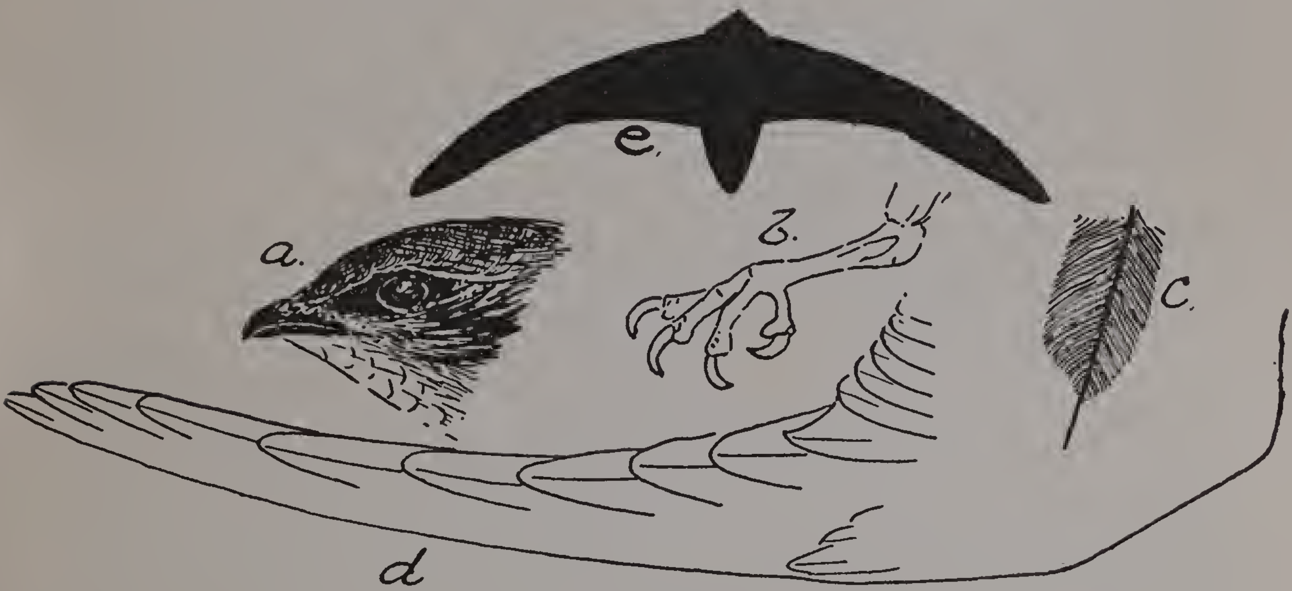


Figure 244

Details of Chimney Swift.

a, head; *b*, foot; *c*, tail feather with spine; *d*, horned wing-tip; *e*, outline in flight; scale, *a*–*d*—natural size; *e*—⅐.

Field Marks. The peculiar, regular bow of the forward wing outline (Figure 244 e), rapid, even, and continuous wing beat alternating with long sweeping sails, general torpedo-like body outline, and dense, dark coloration will distinguish this as a Swift. Its large size, only, will suggest its species.

Nesting. In inaccessible clefts and crannies in the face of high mountain cliffs.

Distribution. Western North America and the Indies, to South America. In Canada, only in the mountainous regions of British Columbia and adjoining Alberta, north at least to southern Alaska and Jasper park.

SUBSPECIES. The type of the species inhabits the West Indies, the bird of continental North America is the Northern Black Swift *Cypseloides niger borealis*.

In the neighbourhood of the beetling mountains, at irregular intervals, one may see, high over head, mere specks in the vault, innumerable black forms darting about in intricate interweaving pattern. They work up the valley or down. For some minutes they may be in sight and then vanish for hours or days. Occasionally, in cloudy weather, they may come down low and then the details of the Black Swift can be made out. A mystery surrounds them and their comings and goings. Most Swifts can be traced with ease to their nests in the inaccessible, narrow clefts high up on the cliff face, but, though the Black Swift is common in many localities and must certainly nest nearby in numbers, it guards its secret well, and few nests have ever been found, or their sites located with certainty.

423. **Chimney Swift.** CHIMNEY SWALLOW. *Chaetura pelagica.* L, 5·43. Plate XXXVIII B. A small Swift of even sooty-brown colour, only slightly lightening on the throat and breast.

Distinctions. The even sooty-brown colour, lightening on the throat and darkening towards the vent, and the tail feathers ending in a sharp spine (Figure 244 c) are sufficient for recognition of the species in the eastern prairie provinces where it is the only Swift to be expected. It is very similar to the Vaux's Swift of British Columbia, which may occasionally occur in western Alberta, but which is considerably smaller and with rump evenly coloured dark like the back. The wing of the Chimney Swift is 5 inches or over.

Field Marks. The characteristic regular bow of the forward wing outline (Figure 244 e) the rapid, even, and continuous beats alternating with long sweeping sails, general torpedo-like body outline, and dense, dark coloration will distinguish this as a Swift. In the eastern Prairie Provinces this is the only species to be expected. In western Alberta, the Chimney Swift in life can be distinguished from the Black and Vaux's Swift only by size. It is much smaller than the first and considerably larger than the second. Identification by this test, however, is very uncertain. High up in the air, with nothing to fix the distance or scale, size is difficult to estimate.

Nesting. Originally in hollow trees or in clefts in rock cliffs. In out of the way places this practice is still followed, but throughout the east such situations are almost entirely abandoned for the flues of unused chimneys, and occasionally the gable interiors of buildings.

Distribution. Eastern North America from the lower edge of the northern spruce forest, southward. In Canada, west regularly to Manitoba and reported as far as central Alberta. The Swifts of Alberta should be closely scrutinized, and carefully identified.

This is an interesting species, swallow-like in outward appearance and food-hunting habits yet structurally distinct from the Swallows. It is an odd example of parallel development of widely separated characters induced by similarity of requirement. Its habits have entirely changed since the advent of the white man and, forsaking hollow trees, it is now practically dependent upon chimneys for sites in which to build its nest. The winter home of the Chimney Swift is unknown. The mystery, however, should not be exaggerated, as there are numbers of Swifts in the western hemisphere looking very like this one and the bird has probably been overlooked in its winter quarters or confused with closely allied forms. The Swift spends much time on the wing and seldom comes to rest except in a chimney or hollow tree. In the autumn, before migration, great numbers gather together and at evening seek the shelter of some ample chimney where they pass the night. They may be seen just before dusk flying about in complicated patterns near the chosen chimney, and as the sun sets, circling, until, as they throw the wings straight up over the back and drop fluttering into the stack, one rapidly following another, they appear to pour in like a miniature maelstrom. The birds cling to the perpendicular walls of the chimney by hundreds, in masses like lumps of soot. Occasionally one with insecure hold drops a few feet, loosening, as it does so, others below; there is a momentary flutter of wings and a small chorus of fine sharp chippings until they find new holdings and settle for the night.

424. **Vaux's Swift.** *Chaetura vauxi.* L, 4·15. A small Swift of even, sooty-brown colour, lightening slightly on throat, breast, and rump. Like the Chimney Swift (Plate XXXVIII B), but smaller.

Distinctions. Its extremely small size (wing, 4·50 or under), faintly pale underparts, and the tail spines (Figure 244 c) will separate it easily from the big Black Swift, the only species it is likely to be confused with in British Columbia. Its possible occurrence in western Alberta makes it necessary to differentiate it from the Chimney Swift; size is the best distinction, but the rump and uppertail coverts are slightly lighter than the back, instead of being of the same colour.

Field Marks. The characteristic regular bow of the forward wing outline (Figure 244 e), rapid, even, and continuous beats, alternating with a long, sweeping sail, and general torpedo-like body outline, with dense, dark coloration, will distinguish this as a Swift. In the eastern Prairie Provinces this species is not to be expected. In British Columbia it is to be confused only with the Black Swift, which is a much larger bird; and the White-throated, which is very local and strongly marked with white. Near the mountains in Alberta it may be taken for the Chimney Swift, from which it can be separated only by its smaller size. Swifts in this locality should be very carefully identified.

Nesting. In communities in hollow cottonwoods, and similar trees, occasionally in buildings, water tanks, etc.

Distribution. Western North America. In Canada, interior valleys of southern British Columbia and on the coast as far north as southern Alaska.

This bird is somewhat local in British Columbia and its distribution is largely determined by the presence of suitable hollow trees. Though much like the eastern Chimney Swift, it has not followed the example of that species in using chimneys for nesting.

Subfamily—Micropodinae. Typical Swifts

This subfamily is chiefly Old World in distribution and is represented in Canada by but one species of very rare or local occurrence. The tail is spineless. The feet are thick, fleshy, and more or less flattened. The single species here considered is easily recognized by its white throat and breast.

425. **White-throated Swift.** *Aeronautes melanoleucus.* L, 6·75. Nearly as large as the Black Swift, but with extensive white throat, breast, and line down abdomen, tips of secondaries, and a patch on each side of the rump.

Distinctions. The only Canadian Swift with decided white patches.

Field Marks. The characteristic, regular bow of the forward wing outline, rapid, even and continuous wing beat, alternating with long sweeping sail and general torpedo-like body outline will distinguish this as a Swift. The white throat and breast, and the white spots on either side of the rump will identify it as this species. The Violet-green Swallow associates with it and has similar white spots beside the rump, but the flight action is that of a Swallow instead of a Swift.

Nesting. In inaccessible clefts and crannies high on the face of mountain cliffs.

Distribution. Western North America south to Lower California. In Canada, known to occur only in the southern Okanagan valley of British Columbia.

Too rare and local in Canada to be of much general interest, but no Canadian ornithologist can visit their haunts without enthusing over them. Their wonderful and spectacular speed of wing and their unattainable communal nesting strongholds, around which they turn and wheel and swoop, so high as to make it uncertain even with field-glasses whether they are birds high up or flies lower down, pique the bird-lover who sees them day by day at their most private affairs and yet never gets familiar with them.

SUBORDER—TROCHILI. HUMMINGBIRDS

These tiny birds, with brilliant flower-like coloration, insect-like flight, and wonderfully varied form, are a typically American order. In a way, they occupy much the same position in the New World as the Sun Birds do in the Old World, but the similarity between the two is superficial and not one of relationship. Many species are highly specialized and exhibit some of the strangest forms in the bird world, including crests, ruffs, fans, and muffs, exaggerated tails, long plumes, and enormous sword-like and fine awl-shaped bills, but their most striking feature is the brilliant metallic colorations that gleam on various parts of the body. They feed largely upon the nectar of flowers. The tongue is very long and protrusive as in the Woodpeckers, but with its sides curled over towards the middle to form a double tube frayed into a brush-like tip that makes a most efficient organ for sucking liquids. Numbers of small insects, however, are taken with the nectar and, judging from feeding experiments on captives, seem to be necessary to the bird's welfare. They are usually minute forms taken from the flowers from which the nectar is obtained.

Hummingbirds as a group are tropical and subtropical species and increase greatly in number to the south, though two species range well to the north.

FAMILY—TROCHILIDAE. HUMMINGBIRDS

There is only one family of Hummingbirds, represented in eastern Canada by a single species, in the far west by three.

Very minute birds, 3·75 inches or less in length, with long, spine-shaped bill (Figure 245), and brilliant metallic colours.

428. **Ruby-throated Hummingbird.** *Archilochus colubris.* L, 3·74. Plate XXXIX A. Male: rich, metallic, bronzy-green above and on flanks. Below, dull white with throat patch of scintillating ruby red. Female and juvenile alike, green above, with white throat slightly streaked with greyish or showing a few sparse spots of brilliant ruby.

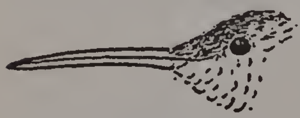


Figure 245
Hummingbird; natural size.

Distinctions. To be mistaken in western Alberta only for the Rufous Hummingbird, Plate XXXIX B. The male with its brilliant green, instead of unmetallic brick red, back is easily identified. Females and juveniles of the two species are more alike, but the green back in this species is always bright and complete; that of the Rufous is duller and has always considerable rufous suffusion on the flanks, below, and especially on the base of the tail.

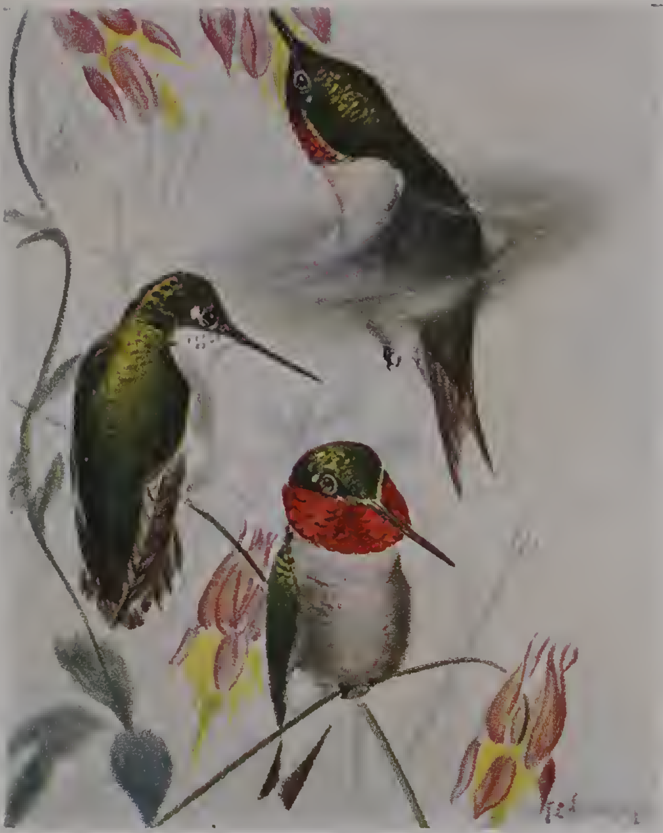
Field Marks. Small size and buzzing, insect-like flight. Except in western Alberta, the only Hummingbird to be expected in the Prairie Provinces. The green back and gleaming ruby throat in the male, and the green back and lack of rufous suffusion in other plumages.

Nesting. In a beautiful structure, covered with bits of lichen cemented together with cobweb, saddled on the top of a branch.

Distribution. Eastern North America. In Canada, west to Alberta, and probably to the foothills. The Hummingbirds of Alberta have not been carefully identified.

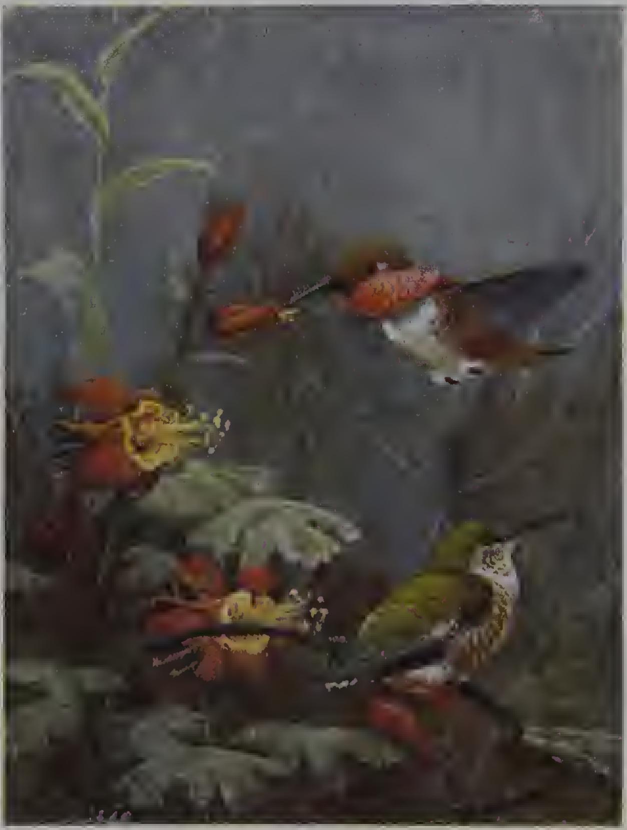
Hummingbirds fly forwards, backwards, sideways, or remain perfectly stationary in the air with equal ease—another instance of parallel development—a bird flying like an insect yet in structure strictly bird-like. The wings vibrate with a rapidity that can be measured only by the tuning-fork method used with insects. This system of flight is fundamentally different in method from that of other birds and consequently the wings differ from the usual type. They are long, narrow, and non-flexible, and the keel of the sternum is immensely deepened to give support to the great muscles that move them. In proportion to its wing-spread a Hummingbird has a breast keel nearly three times larger than that of a Pigeon, a bird of average flight, or forty times larger than that of an Albatross.

Economic Status. When it is remembered that some of the smallest insect pests are the most destructive, we can realize that possibly the economic importance of the Hummingbird may be greater than suspected.



A. Ruby-throated Hummingbird; scale, ½

Female Males



B. Rufous Hummingbird; scale, ⅓

Male
Female

Besides nectar, its food seems to be composed of small flies, gnats, minute bees, wasps, and other flower-haunting and pollen-eating forms. Apparently no harm can be charged against the species and it may do good out of all proportion to its size.

429. **Black-chinned Hummingbird.** *Archilochus alexandri.* L, 3·50. A small Hummer. Male: metallic bronzy-green above, dull whitish below. Throat and gorget black with purple-violet reflections on its lower edge. Female: similar, but with dull white throat.

Distinctions. The male, with its black throat and gorget not elongated or projecting at the sides, is very distinctive; but the female and young birds are quite like similar plumages of the other Canadian Hummers. There is little geographical likelihood of confusion with the Ruby-throated. From the Rufous it may be easily separated by its lack of any rufous suffusion. From the Calliope by its larger size, solid dark throat in the male, and entire absence of rufous in the female.

Field Marks. The black throat and gorget is a certain recognizable field mark for the male, but it must be remembered that these jewel-like gorget colours in other species only flash out when viewed from particular angles, and from many directions they show as black. Females do not show ruddy on flanks and undertail as do the Rufous and Calliope Hummers.

Nesting. Nest a beautiful structure of vegetable down and cobwebs saddled on a branch.

Distribution. Western North America, from British Columbia to northern Mexico, east to Montana. In Canada, only on the coast and in the interior of southern British Columbia. Not so far noted on Vancouver island. Most common in the interior valleys.

A rare and rather local little Hummer.

433. **Rufous Hummingbird.** *Selasphorus rufus.* L, 3·50. Plate XXXIX B. Male: all above bright, brick red, not iridescent except for slight green reflections on crown. Red suffuses over underparts leaving band below gorget white. Throat and gorget fiery red. Female and juveniles: bronzy, iridescent green above, with base of tail rufous at sides; below, dull white washed with rufous on flanks and undertail coverts. Usually irregular spots of flaming iridescence on throat.

Distinctions. The male with its red back and flaming gorget, elongated and projecting at the sides like a shield, is unmistakable. The large amount of rufous wash on the body will identify the female and young birds from the Black-chinned, but they may be difficult to separate from similar Calliope Hummingbirds even when in hand.

Field Marks As above distinctions.

Nesting. Nest a beautiful structure of lichens and cobwebs saddled on a branch.

Distribution. Western North America from the southern Yukon boundary to New Mexico. In Canada, British Columbia and the adjacent foothills of Alberta. It is not known to extend east on the prairies.

This is the common Hummingbird of British Columbia, and is seen in suitable localities everywhere. One of the problems of common bird life is what becomes of the male hummingbirds in the summer. In spring, and while the species are mating, the sexes are equally common, but as soon as nesting duties are seriously engaged in, the brilliant, jewel-throated male ceases his interest in proceedings and not only lets his more sober-coloured mate take the whole burden of family raising, but disappears from the scene entirely. That the gay Lothario follows the flower season up the mountain sides and, in the alpine meadows at higher altitudes, finds a prolonged flower-producing spring, sounds reasonable, but so far lacks demonstration. At any rate, it fails to explain a similar disappearance of the male Ruby-throated that lives out on the flat lands far from such mountain summer resorts. The phenomenon being common to all the Hummers requires an explanation that will fit them all. The author suspects that the males depart on their southward migration as early as July like some of the Waders.

436. **Calliope Hummingbird.** *Stellula calliope.* L, 2·75. A small Hummer. Male: iridescent bronze-green above, dusky white below. Throat and gorget composed of elongated lanceolate feathers of metallic rose-violet. Female: similar but without violet gorget.

Distinctions. The male with gleaming violet gorget, elongated and projecting at the sides, is unmistakable. The female much like those of other species, but smaller and with less red overwash than the Rufous.

It is smaller and with a more rounded tail than the Ruby-throated, the only Hummer that it is likely to be confused with in western Alberta. From the Black-chinned, it can be separated by its reddish flanks.

Field Marks. The male with its brilliant reddish-violet gorget, like the half of a many-pointed star on a white ground, is easily recognized when it faces the observer. The female may be separated from the female Black-chinned by its rufous flanks, but it cannot be told in life with any certainty from the Rufous, except when in hand.

Nesting. Nest a beautiful structure of lichens and cobwebs on a branch.

Distribution. Western North America from British Columbia to New Mexico. In Canada, southern British Columbia, part of the Alberta foothills, and, on the coast, north to Wrangell, Alaska.

This little Hummer is quite common in the interior valleys of southern British Columbia. In common with the other Hummers it is attracted to the sweet oozing sap from Sapsucker drillings in black birches and about trees so tapped, the branches black with the sticky wetness, quite a cloud of mixed Hummingbirds will often be found.

They are peppery, pugnacious little midgets, and never meet each other without a battle of elfin fury. They dash together squeaking in fine high tones almost above the limit of the ear to hear, tower into the air, exchange stroke and parry with their rapier-like bills, and then descend to opposite sides of the bush under examination only to meet and engage again shortly. None seems to be seriously damaged by the encounter, but they never learn to bear or forbear, and a sap-running tree is a centre of rapidly buzzing wings, thin, angry squeaks, and dashing forms mixing in constant fray, from which come flashes from gleaming throats of kaleidoscopic brillancy. Were Hummingbirds as large as their courage, their haunts would not be safe for anybody.

Order—Passeres. Perching Birds

The order *Passeres*, Passerine or Perching Birds, is the largest and most important division of modern birds. The lower and more generalized types of birds have in the past been in the ascendant; but today the highly specialized *Passeres* are dominant; they constitute nearly if not quite half our present living forms and are put at the head of the classification by systematists. They are rather difficult to diagnose popularly, but they have a great number of characters common to themselves and not shared by other orders—the highly developed larynx, a singing organ, with complicated muscular control, for example. All are not notable singers, but all are equipped with song mechanism. Generally, a bird may be referred to this order by a process of elimination, as not belonging to any of the previous orders. The feet (Figure 246) are not webbed, the hind toe is nearly as long as the middle one, and the whole foot is well adapted for perching. The bill is hard and horny, without cere or soft base, and the nostril tubes do not communicate with each other as in some of the other

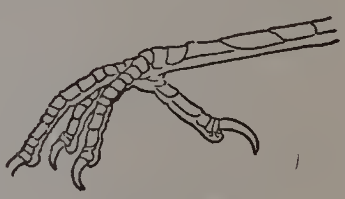
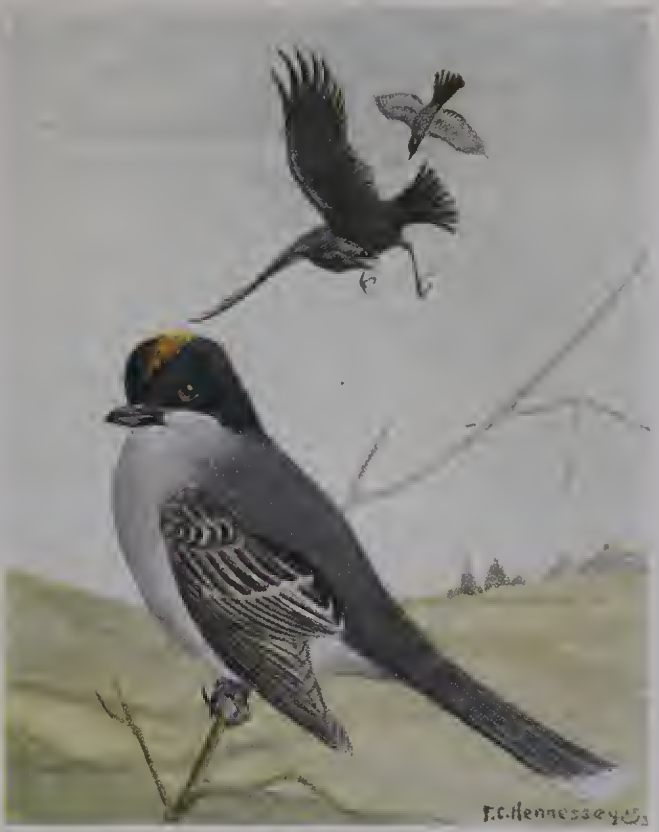
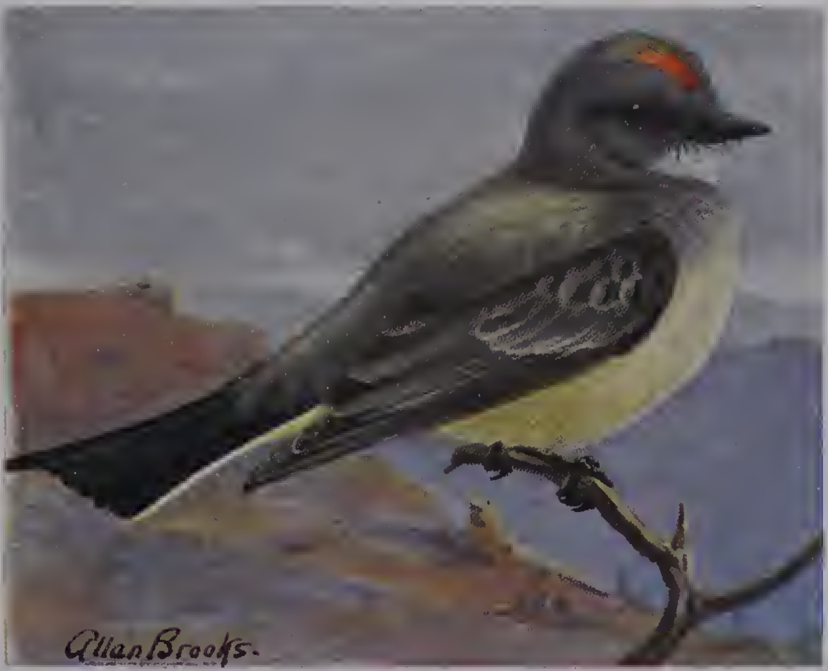


Figure 246
Foot of Percher.



A. Kingbird; scale, ¼


Allan Brooks.

B. Arkansas Kingbird; scale, ⅓

orders. Two suborders are represented in Canada: *Clamatores*, the Songless Perchers; and *Oscines*, the Song Birds.

SUBORDER—CLAMATORES. SONGLESS PERCHERS

This suborder is constituted upon a basis of anatomical structure. The name Songless Percher is not intended to indicate that the birds are silent, but that they are less tuneful than the *Oscines*, with a larynx less highly specialized. Only one family of this suborder occurs in Canada, the *Tyrannidae* or Tyrant Flycatcher.

FAMILY—TYRANNIDAE. TYRANT FLYCATCHERS

General Description. The Tyrant Flycatchers are most easily recognized among Canadian birds by their bills (Figure 247) which are comparatively long, somewhat flattened and broadened at the base, wider than high, and slightly hooked at the extreme tip.

All Canadian Flycatchers except the spectacular Scissor-tailed, which is only a very rare visitor in this country, the strongly marked Kingbirds, and the Crested Flycatcher, are birds of dull olive coloration, only lightening or whitening on the breast, and without much colour variation.

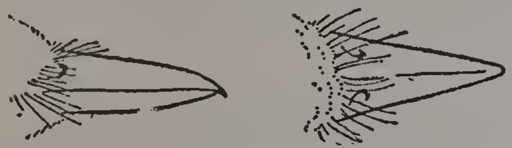


Figure 247
Bill of Flycatcher.

Field Marks. Easily recognized in life by their characteristic habits and attitudes which soon become familiar to the discerning observer. When perching they usually sit in an upright attitude, quite still except for an occasional spasmodic jerking of the tail. On observing a passing insect they dash out and capture it in the air with a nimble evolution, and quick snap of the bill, and immediately return to their original station.

The Flycatchers are a most difficult family to identify specifically. Some of them are strongly characterized, but some of the commonest ones are so nearly alike as to puzzle the experienced ornithologist. In identifying Flycatchers in life, attention should be paid to their voices. These and the type of habitat in which they are observed are good guides to differentiation in the case of the more puzzling species.

Economic Status. Their food consists almost entirely of insects, caught on the wing, for capturing of which the broad bill is well adapted. As they take most of their food in the air near the ground they catch varieties of insects not taken by other birds. The species found in their stomachs include beetles, flies, wasps, crane-flies, ants, grasshoppers, tent-caterpillars, and moths. Indeed, nearly all the harmful species of insects are found in their crops and the group must be classed as highly beneficial birds.

443. **Scissor-tailed Flycatcher.** *Muscivora forficata.* L, 13 (about). (Tail, 9.) This Flycatcher is an occasional wanderer within the borders of Canada, from subtropical America. It is unmistakable—a light, ash-coloured bird about the size of a Kingbird with darker wings, scarlet or orange cap, and the same colour under the wings, with a great tail 8 to 9 inches long, split to a depth of 6 inches or more, which, when the bird is at rest, opens and closes like a pair of scissors. Strangely enough two of our best authenticated records come from York Factory on Hudson bay, and the species has been seen in southern Manitoba. With this record before us, it is difficult to state positively what bird may or may not be found anywhere in Canada.

444. **Kingbird.** BEE MARTIN. *Tyrannus tyrannus.* L, 8·51. Plate XL A. A large, dark grey (almost black) and white Flycatcher.

Distinctions. The black and white coloration, orange crown patch, showing in moments of excitement, and the black tail tipped with white, as if dipped in white paint, are unmistakable. Likely to be confused only with the Arkansas Kingbird, but blacker above, especially on head; white on throat, and white below instead of grey and sulphur-yellow.

Field Marks. A large black and white Flycatcher, inhabiting the open spaces. The orange crown patch is rarely seen in life. The head and white-tipped tail appear to be dead black in strong contrast with the pure white front and underparts.

Nesting. Nest, a well-built structure of weed stalks, grasses, and waste vegetation, lined with plant down, rootlets, and fine grasses, in bushes or trees. Nests commonly in orchards and shrubbery, near cultivated fields. It is partial to the vicinity of water.

Distribution. North and South America. Throughout southern Canada. Rare on Vancouver island.

The Kingbird is a familiar species, coming close around houses and orchards, and the presence of a pair nesting nearby is one of the best preventives of the depredations of Hawks or Crows. None comes anywhere near the Kingbirds' home without being vigorously challenged. The Kingbird flies at the intruders with an energy that is surprising in so small and weak a bird. It cannot do them any real harm, but it plagues them mightily and its outcries give wide notice of the affair. Owing to its small size and agility in the air, it can strike a large enemy from any quarter, and is practically safe from counter attacks from anything heavier and less agile.

It is amusing to see a great Crow or Hawk dodge its attack for a moment, and then make the best speed possible from the uncomfortable neighbourhood. After driving the intruder as far as it sees fit, and demonstrating its pre-eminence within its own territory, it comes back chattering with excited triumph and, with a flirt of tail, resumes its isolated outlook on some upstanding twig, as if to await the applause of its mate and the surrounding community. Withal, the Kingbird is a charming fellow to have about. It may be something of a braggart and a swashbuckler, but with a grace and naturalness that disarm criticism. Certainly, the defence of hearth and home, especially when it assists in guarding the property of others, is not very reprehensible—even though unaccompanied by modesty.

Economic Status. The name Kingbird is of obvious application, but the other term applied to it, "Bee Martin," naturally raises suspicion as to its feeding habits. It is accused of catching honey bees, and most circumstantial accounts of its doing so are given credence. The record given below shows that the charge of taking bees is to some extent true, but it shows also that the bees caught are mainly drones that can well be spared. The old story of the Kingbird opening its brilliant crest to decoy the bee within reach, under the impression that it is a flower, may be dismissed as groundless folk-lore, though it has received wide circulation and acceptation. Of 624 Kingbirds' stomachs examined by the United States Department of Agriculture in 1911, 22 contained a total of 61 bees— 51 of which were drones, 8 workers, and 2 were indeterminate. The remainder of the food consists of other insects, including many noxious forms and a little wild fruit and berries.

445. **Grey Kingbird.** *Tyrannus dominicensis.* L, 9. Like a Kingbird but lighter, ashy above rather than blackish, and underwing and tail coverts faintly yellowish.

Distinctions. Somewhat intermediate in colour between Kingbird and Arkansas Kingbird, but nearer the former. Bill very thick and swollen and tail only lightening at tip instead of with sharply defined white band. Slightly yellow underwings and tail.

Field Marks. Too rare in Canada to be identified by sight.

Distribution. Southeastern United States, West Indies to northern South America. In Canada, one record for southern Vancouver island.

An accidental straggler that may never occur again within our borders.

447. **Arkansas Kingbird.** *Tyrannus verticalis.* L, 9. Plate XL B. A large, pale-eoloured Kingbird, sulphur-yellow below.

Distinctions. With its light grey head, breast, and back, and bright yellow underparts, likely to be confused only with the Crested Flycatcher. Larger than that species; head and back greyish instead of olive, tail almost black instead of with bright rufous inner webs, and a concealed orange crown-spot.

Field Marks. In life, by habitat and action, likely to be confused only with the Kingbird; but the pale head and underparts, nearly white chin changing to grey on throat, yellow abdomen, and tail not tipped with white, but narrowly margined with it at the sides, make separation easy. In colour, superficially like the Crested Flycatcher, but inhabiting the open, instead of the forest tree tops, and with regular Kingbird action. Voice entirely different, chattering like a Kingbird and not "*whooping*" and "*whipping*" like the Crested.

Nesting. Nest a well constructed affair like the Kingbird's but more likely to contain bits of string, newspapers, or strips of rags. Nests close about the house and even in eavestroughs, down spouts, and similar situations. Is probably a good tenant for bird boxes of proper type.

Distribution. Western North America. In Canada, north over the southern parts of all western provinces. Apparently a late migrant in western Manitoba, and rare on Vancouver island.

A very beautiful bird, similar in general habits and action to the Kingbird, but rather less aggressive, less likely to go out of its way to seek trouble, and rather more confiding in the human neighbourhood. It is not an abundant bird in the southern Prairie Provinces, but rather local, as it requires the presence of trees, and will probably increase with the growth of tree plantations. It is notable that nearly every station along the Canadian Pacific railway, where trees have been successfully planted, has a pair of Arkansas Kingbirds in possession, and it seems almost to prefer the hubbub of such localities to quieter retreats.

452. **Crested Flycatcher.** GREAT CRESTED FLYCATCHER. *Myiarchus crinitus.* L, 9·00. About the size of the Kingbird, but lighter in build. Even olive-brown above turning to rufous on the inner webs of the tail. Throat and upper breast ash-grey. Underparts sulphur-yellow.

Distinctions. Likely to be confused only with the Arkansas Kingbird; like it in general coloration, but back to crown uniformly brown, and no orange crown-spot. Tail, browner than back and with inner webs strongly rufous.

Field Marks. A large, yellow-bellied Flycatcher, inhabiting the upper branches in the woods. Unlike either of the Kingbirds in habitat, action, or voice. Its loud, long-drawn cry "*Wheeeep*" and lower "*Whip-whip-whip*" are very characteristic, although something similar to some of the notes of the Olive-sided Flycatcher, which is a very different appearing and acting bird. The Crested rarely poses for long on isolated branch tips or dead tree tops, and is more often seen passing from branch to branch amidst the foliage, or from tree to tree.

Nesting. In holes abandoned by Woodpeckers or in hollow trees and branches. It takes kindly to bird boxes in the garden. The bird shows a remarkable fondness for utilizing cast snake skins in nest building. Scarcely a nest of the species but contains one or more.

Distribution. Eastern North America. In Canada, including the wooded and bluffy parts of southern Manitoba.

A Flycatcher of the woodland tree tops. Its loud insistent voice is constantly heard in the summer, but rarely at any distance from dense forest.

Economic Status. Beetles, locusts, ants, crickets, flies, and moths constitute the bulk of its food. It takes more parasitic wasps and beetles than most birds, but not enough to counterbalance the pests it destroys.

456. **Phoebe.** BRIDGE PEWEE. *Sayornis phoebe.* L, 6·99. Plate XLI A. One of the larger Flycatchers, but much smaller than any of the preceding. All above, uniform, dull olive; dull white below, without any distinctive colour marks.

Distinctions. The small, greenish Flycatchers are perhaps the most difficult of American birds to separate. Fortunately, each has a typical habitat and a characteristic note, which are both good guides to differentiation in the field. The Phoebe is, next to the Olive-sided, the largest of these small, dull-coloured Flycatchers, and the most easy to recognize. It is most likely to be confused with the two Wood Pewees, but its legs and feet are larger and stouter.

Field Marks. The head of the Phoebe is generally a little darker, and in stronger contrast with the body, than in other Flycatchers. The sidewise sweep of tail and unbarred wings are characteristic. The note, however, a quickly uttered "*Phoe–be*" with strong accent on the first syllable, is the best field mark. The Wood-Pewee's note is long-drawn out and that of the Least is short and explosive. The habitat, about bridges and culverts, or in the vicinity of barns and buildings, is very suggestive of identity.

Nesting. A large structure of mud, moss, and grasses under bridges, or the overhangs of buildings or ledges of rock.

Distribution. Eastern North America. In Canada, west through the Prairie Provinces, northward in the woodlands.

No place suits the Phoebe so well for nesting as the flat timber or projecting ledges of an old bridge over some little stream where the moist air abounds in insect food. In many parts of the country there is scarcely a bridge but has its pair of Phoebes in the summer. However, the mud nests are not restricted to bridges but are plastered on the slightest projection under the eaves of an outbuilding or even under the family porch. It is a friendly, familiar bird and comes close to man wherever it finds a welcome. Unfortunately its large, untidy looking nests are occasionally the dwelling place of innumerable parasites, in other words, bird-lice. The usual course when they appear is to knock the nest down with a stick and apply boiling water. The application of common insect powder to the nest is better, for this will kill the parasites and help to retain about the house a confiding and attractive bird.

It is reassuring to know, however, that bird-lice will not remain on the human body, the temperature of which is not high enough for them.

457. **Say's Phoebe.** *Sayornis sayus.* L. 7·50. Plate XLI B. A large, phoebe-like bird; grey brown, rather than olive-brown above, with head scarcely darkening. Greyish breast, and underparts suffused with rusty ochre.

Distinctions. An even grey-brown bird with abdomen washed with rusty ochre, fading away on dull grey throat. Can be mistaken for no other Canadian species.

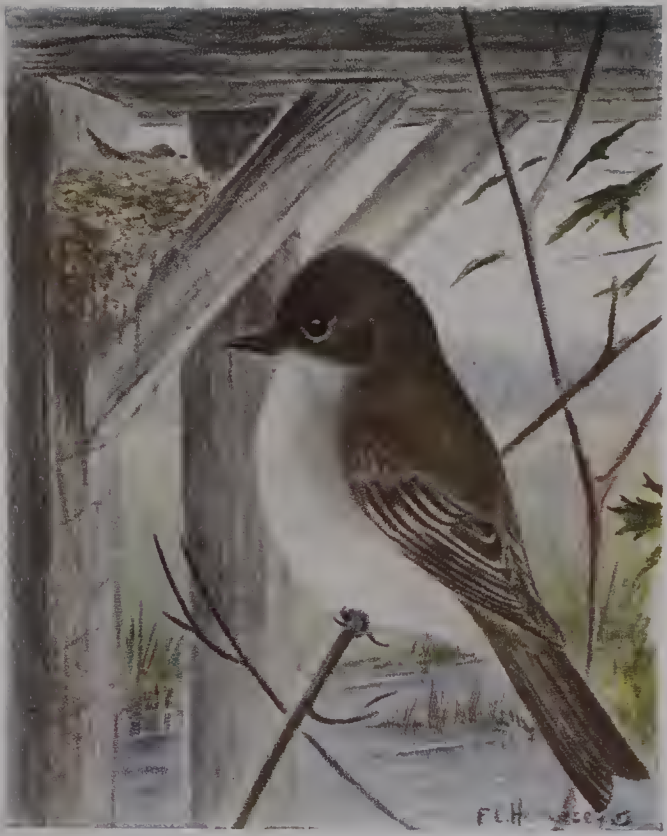
Field Marks. A Flycatcher, haunting barns, outbuildings, and cliffs. Even ashy brown in colour, similar in contour and poise to the Arkansas Kingbird, but much smaller and darker head; dark brick colour below instead of yellow.

Nesting. A large structure of moss, lined with vegetable fibre, fur, or feathers, on the sheltered beam of a building or in an horizontal cleft in a cliff.

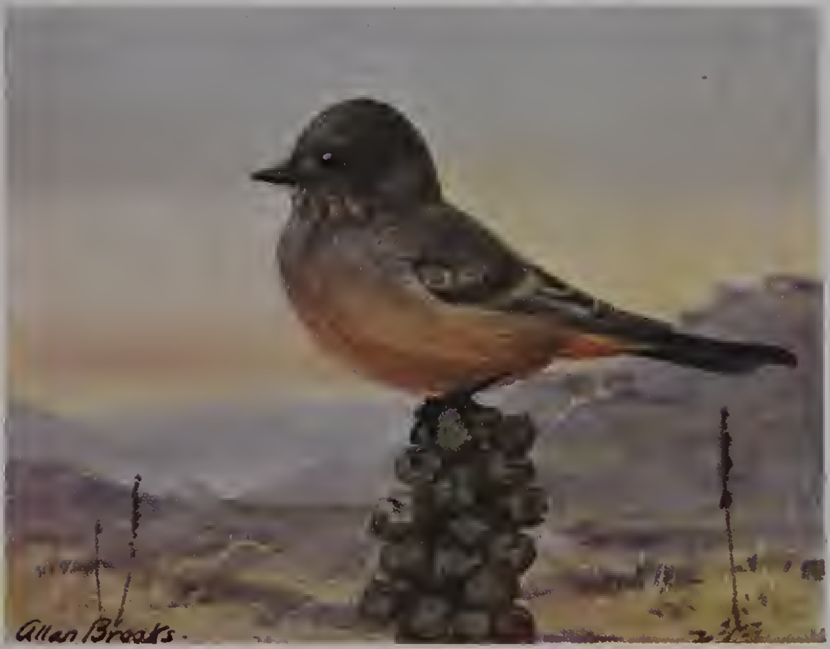
Distribution. Western North America, from central Alaska and Mackenzie, south to New Mexico. In Canada, east to southwestern Manitoba, where it seems to be a comparatively recent arrival.

Around farm buildings in the west, Say's Phoebe largely takes the place of the Phoebe in the east, but it also frequents the most arid and lonely spots. No coulée, bad lands, or mountain gorge is too dry, or desolate to harbour a pair. About the tool-house of the farm, the freight sheds of a railway, or the heated exposures of rock-slide or cliff, they are equally at home.

459. **Olive-sided Flycatcher.** *Nuttallornis borealis.* L, 7·39. The largest of the Olive-green Flycatchers. Much like the Phoebe (Plate XLI A), but larger and the olive less clear (blacker), and with extensive masses of dark colour on either side of the chest generally meeting in a narrow band across breast.



A. Phoebe; scale, $\frac{1}{3}$



B. Say's Phoebe; scale, $\frac{1}{3}$

Distinctions. The conspicuous dark patches at the sides of the chest and along the flanks, and the dark undertail coverts with white tips or broad inverted V marks near the tips will separate this species from the Phoebe which it resembles. The head and face are not noticeably darker than the back. At the sides of the lower back occasionally displayed, though usually concealed by the closed wings, are patches of fine silk-like plumage of pure white or cream colour. These points will separate the Olive-sided from any of the other Flycatchers.

Field Marks. In life, the Olive-sided Flycatcher looks more like a Kingbird with a dark coat partly closed over a white vest, than a Phoebe. When the white, silky feathers show over the wings just above the rump, as sometimes occurs, the species cannot be mistaken. The call notes are distinctive, though something like those of the Crested Flycatcher. The most common is a loud, penetrating "*Quick--three--beer;*" the Alder Flycatcher has a note that may be syllabized like the last two words, but it is low and sibilant and not loud and ringing.

Nesting. Nest of twigs and bark strips lined with moss and grasses on coniferous lands, usually very high up.

Distribution. North and South America. In Canada, across the continent, breeding in the northern evergreen forest.

This is typically a bird of the burnt ridges. Its favourite perch is on the tip-top of a gaunt dead pine in the open, surrounded by second-growth and brûlé, from whence its clear penetrating demand can be heard far and wide. In migration, its route probably follows the timber east and west and it is not often seen in the open prairie country.

461. **Eastern Wood Pewee.** *Myiochanes virens.* L, 6·50. A small, dull olive and whitish Flycatcher, similar in general coloration and design to a number of allied species. Very like Plate XLII A.

Distinctions. Separated from the Phoebe and other Flycatchers except the Western, by short tarsi and long wings, the latter being decidedly longer than the tail. Differs from its close relative, the Richardson's Pewee, which is specifically distinct, by a more olive back, crown darker in more distinct contrast with the body; and in having the breast less suffused with brownish-ash. These distinctions can only be determined by direct comparison of specimens, and even then are not always easy to see.

Field Marks. The Peweee never flirts its tail as does the Phoebe. The sides of the breast are slightly darker, giving a better defined and narrower light median line. Its best identification mark, however, is its call-note which is much like that of the Phoebe but drawn out into a long "*Pee-e-wee*" without appreciable accent but with a risin inflexion at the end. The female varies the call by dropping the last note, making it "*Pee-e-e-e.*"

Probably best separated from the Richardson's Pewee by this call, which is noticeably different from the note of that bird.

Nesting. A well made but slight structure of fine fibres and rootlets, covered with lichens and saddled on a branch.

Distribution. North and South America. In Canada, west at least to Manitoba.

The long-drawn plaintive "*Pee-e-we*" of this bird is a characteristic sound of the open woodlands in the spring, and after other birds have relapsed into midsummer silence its mournful note may still occasionally be heard.

Economic Status. The food of the Wood Pewee is similar to that of the other Flycatchers, but modified, of course, by its woodland habitat. As it is not retiring, and frequents open groves and orchards freely, it is of direct benefit to the agriculturist.

462. **Richardson's Pewee.** *Myiochanes richardsoni.* L, 6·50. Plate XLII A. In colour and form like the Eastern Wood Pewee, but darker.

Distinctions. Separated from the Phoebe and other Flycatchers, except the Eastern Wood Pewee, by its short tarsi and long wings, the latter being decidedly longer than the tail. Differs from its close relative, the Eastern Wood Pewee, from which it is specifically distinct, by greyer (less olive) back, lighter crown in less distinct contrast with body, and in having the breast more suffused with brownish ash. The distinctions from this last species can only be made by direct comparison of specimens and then not always easily.

Field Marks. The Pewee never flirts its tail as does the Phoebe. Its best identification mark, however, is probably its call-note, which bears a casual resemblance to that of the Eastern Wood Pewee but is more abrupt and emphatic, and has been syllabized "*dear-me*" instead of a long drawn "*Pee-e-weee.*" The two Pewees usually keep both well up in the trees, and are seldom seen in the low brush where similar little Flycatchers are often seen.

Nesting. A well-made, but slight, structure of fine fibres and rootlets, covered with lichens, lined with wool or hair and saddled on a branch.

Distribution. Western North America. In Canada, from southern Manitoba westward to the coast. The ranges of this and the Eastern Wood Pewee have not been very well defined on the prairies, owing largely to the difficulty of separating the two birds and the lack of specimens.

SUBSPECIES. The race attributed to North America is the type one, the Western Wood Pewee *Myiochanes richardsoni richardsoni.*

Though so nearly like the Eastern Wood Pewee that even so keen an authority as Dr. Elliot Coues admits that it is "impracticable to pronounce upon a Pewee, in the closet, without knowing its locality" all are agreed from observation in life that the two are specifically distinct. Typical birds of the two species are noticeably distinct and groups of specimens en masse show convincing differences.

Economic Status. Probably very similar to that of the Eastern Wood Pewee.

463. **Yellow-bellied Flycatcher.** *Empidonax flaviventris.* L, 5·63. A small Flycatcher, similar in pattern to the Wood Pewee (*See* Plate XLII A), and the little green Flycatchers, but the browns and olives of those species replaced by distinct olive-green and the Whites by dull sulphur yellow.

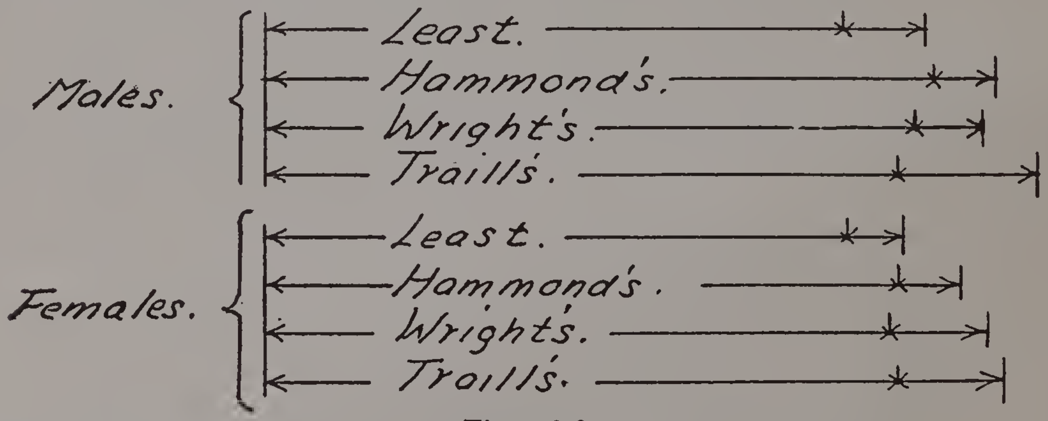


Figure 248
Maximum and minimum wing lengths of Flycatchers most likely to be confused; laid off natural size.

Distinctions. This and the similar Western Flycatcher are the yellowest of all the small Flycatchers. Other species in the autumn may show suggestions of yellow below, but never so clearly as in the least yellow individuals of these two. It resembles very closely the Western Flycatcher. In the Yellow-bellied Flycatcher the olive and yellow are of a clearer and brighter tint and decidedly less ochreish than in the Western, and the first primary is longer instead of shorter than the sixth (Figure 249 b).

Field Marks. A small, generally yellow Flycatcher, most yellow below. The notes, "*Te-pee-a*"—three syllables with accent on the middle one, are distinctive. Its "*Pe-wick*" is something like the call of the Phoebe, but the first syllable is not accented. Probably not separable with certainty from the Western Flycatcher in life.

Nesting. On the ground, nest built of moss, lined with grasses.

Distribution. North and South America. In Canada, breeding in the coniferous forest, west to northern British Columbia. Rare on the prairies.

A woodland Flycatcher that favours second growth and thickets bordering heavier timber.

Economic Status. Food habits very similar to those of the other small Flycatchers. Its normal station on the edges of woods bordering cultivated land makes it of value to the agriculturist.

464. **Western Flycatcher.** *Empidonax difficilis.* L, 5·60. A small Flycatcher, similar to the Wood-Pewee (*See* Plate XLII A) and the little green Flycatchers in pattern, but the browns and olives of those species replaced by distinct ochraceous-olive and the whites by dull yellow tending towards ochre.

Distinctions. This and the Yellow-bellied Flycatcher are the yellowest of all the small Flycatchers. Other species in the autumn may show suggestions of yellow below, but never so clearly as the least yellow individuals of these two. In the Western Flycatcher the olive and yellow are duller and more distinctly ochreish than in the Yellow-bellied, the inner edge of the wing at the wrist is brownish yellow, instead of sulphur yellow, and the first primary is shorter than the sixth (Figure 249 a).

Field Marks. A small, yellow Flycatcher, most yellow below. The notes are like those of the Yellow-bellied, but more sibilant and softer. They may be syllabized as "*Tis-yip.*" It probably can not be separated from the Yellow-bellied Flycatcher in life with certainty.

Nesting. Low down, usually on the ground. Nest of moss lined with grasses.

Distribution. In Canada, confined to the coast strip west of the Coast and Cascade ranges in British Columbia.

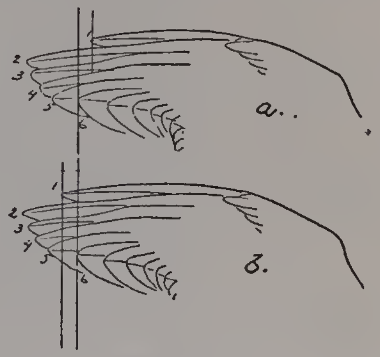


Figure 249

Wing formulæ of Flycatchers most likely to be confused.

a, outer primary shorter than 6 — Wright's; Western.

b, outer primary longer than 6 — Yellow-bellied; Traill's; Least; Hammond's.

466. **Traill's Flycatcher.** *Empidonax traill.* L, 6·09. A small Flycatcher, slightly larger than other members of its genus (Figure 248) and very similar to them in colour. Coloration similar in general to that of the Wood Pewee (Plate XLII A), but smaller.

Distinctions. Typical birds are olive or brownish-olive on the back, and whiter below than other comparable species. There is a faint greyish breast-band, but the throat is distinctly white and the abdomen clear white, washed towards vent with clear, light sulphur. In general, it is the least muddy in coloration of these confusing Flycatchers, but many individuals occur that are difficult to place. Its larger average size is a helpful character, but, as shown in the diagram (Figure 248), not conclusive, except in the largest individuals. It is best identified in the field.

Field Marks. A small Flycatcher with whiter throat and underparts than its relatives. A white eye-ring is usually distinct. In colour, most like the Least, but larger and with entirely different habitat and notes. It frequents willow and alder thickets, usually along streams; is quite shy, and flits from point to point ahead of the inquisitive observer, rarely allowing close approach, but alighting on commanding topmost twigs, from whence it flutters a short stacatto "*We're-here*" or "*Ezee-e-up*" with the accent on the last syllable in each case.

Nesting. In crotch of small growth near the ground; nest of coarse grasses, plant down, and fibres, lined with grasses.

Distribution. North America to South America. In Canada, across the continent north to the coniferous forest.

SUBSPECIES. Two subspecies are recognized. The Western Traill's Flycatcher *Empidonax trailli trailli* occupies southern and western British Columbia with the adjacent Alaskan coast. The Alder Flycatcher *Empidonax trailli alnorum* inhabits the remainder of the specific range in Canada. The latter is slightly greener (less brown), the dusky breast-band less distinct, and the light throat in greater contrast.

Economic Status. Similar to that of the other Flycatchers. Its food is almost entirely insects, the species destroyed being mostly those frequenting waste land.

467. **Least Flycatcher.** CHEBEC. *Empidonax minimus.* L, 5·41. The smallest of the little green Flycatchers. Of general colour design of dusky-olive and white like the Wood Pewee (Plate XLII A), but very much smaller.

Distinctions. Almost identical in colour with Traill's. Best separated from other little Flycatchers by size, wing 2·60 inches or under, though the diagram (Figure 248) shows that other species may come within this measurement. Distinguished from Wright's by having the outer primary longer than the sixth (Figure 249 b).

Field Marks. A very small Flycatcher of the usual dull olive coloration, with fairly conspicuous white eye-ring, and throat. The greyish suffusion on underparts restricted. Best recognized by its characteristic call—a quick, explosive "*Che-bec,*" like a dry, hacking cough, sometimes repeated many times. Habitat—woodlands, instead of shrubbery wastes.

Nesting. In the crotch of a tree; nest of plant down, fine wood fibres, rootlets, and long hairs.

Distribution. Northern and eastern United States to South America. West in Canada to Alberta, north into Mackenzie.

This is a bird of the orchard and the trees about the house, overgrown fence-lines, and other familiar localities where close proximity to cultivation makes its services of noteworthy benefit.

Economic Status. The food of the Least Flycatcher does not differ materially from that of the other members of the family, but the bird's familiarity and confidence bring it close to man where its useful qualities have the maximum influence.

468. **Hammond's Flycatcher.** *Empidonax hammondi.* L, 5·60. The duskiest and, except the Least, the smallest of the little green Flycatchers. General colour design of dusky-olive and white, like the Wood Pewee (Plate XLII A), but much smaller.

Distinctions. Hammond's Flycatcher is almost identical in colour with Wright's and averages a little smaller in length than that species and a little larger than the Least, the comparative wing measurement can be seen in Figure 248. It is greyish olive rather than clear olive. The throat and breast are suffused with more dusky clouding than any other similar species, and the throat is never clear white. Best separated from the Least by its slightly larger size, wing 2·60 or over. From Wright's, with which it is most likely to be confused in British Columbia, by having the first primary longer than the sixth (Figure 249 b). There is a yellowish phase of this species, and of Wright's also, in which the yellowness of the underparts approaches that of the Yellow-bellied or Western Flycatchers.

Field Marks. A very small, obscurely coloured Flycatcher, with dingy, dull breast and throat. In the mountains, in summer, Hammond's Flycatcher is the *Empidonax* representative at 3,000 feet elevation, and above; Wright's and Traill's occupy the lower levels. In migration this distribution may not hold. The note is a brisk "*Sewick*" or "*Switch--oo*" quite different from the hacking "*Chebec*" of the Least, or the longer "*We're-here*" of Traill's. It is difficult to separate from Wright's even by voice.

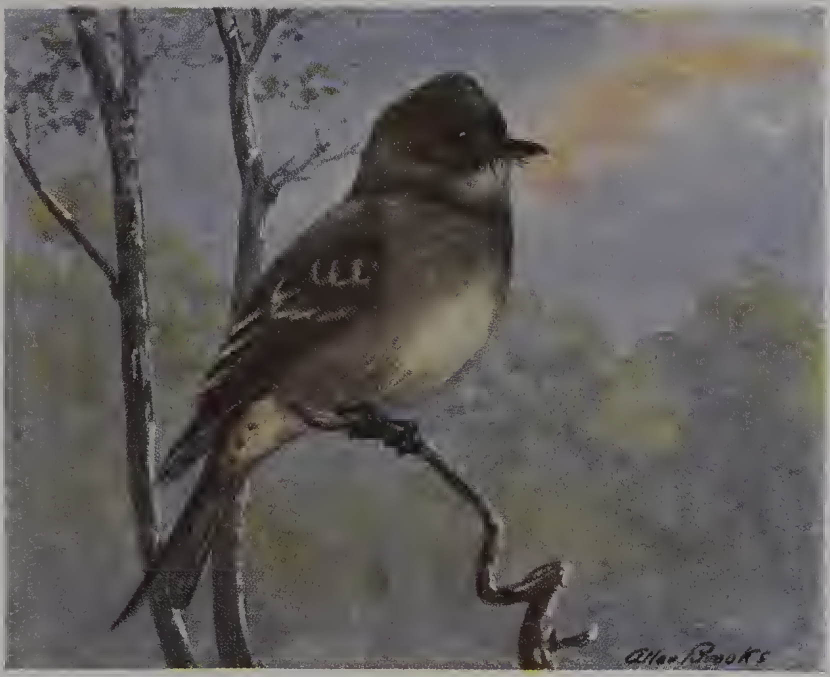
Nesting. Nest of fir-twigs, grasses, and moss, lined with fine grasses and vegetable down, on horizontal limb at a considerable height.

Distribution. Western North America from southern Alaska to southern California. In Canada, east to the Rocky mountains. It has been reported from Mackenzie River country and central Alberta, but its occurrence there is rather uncertain.

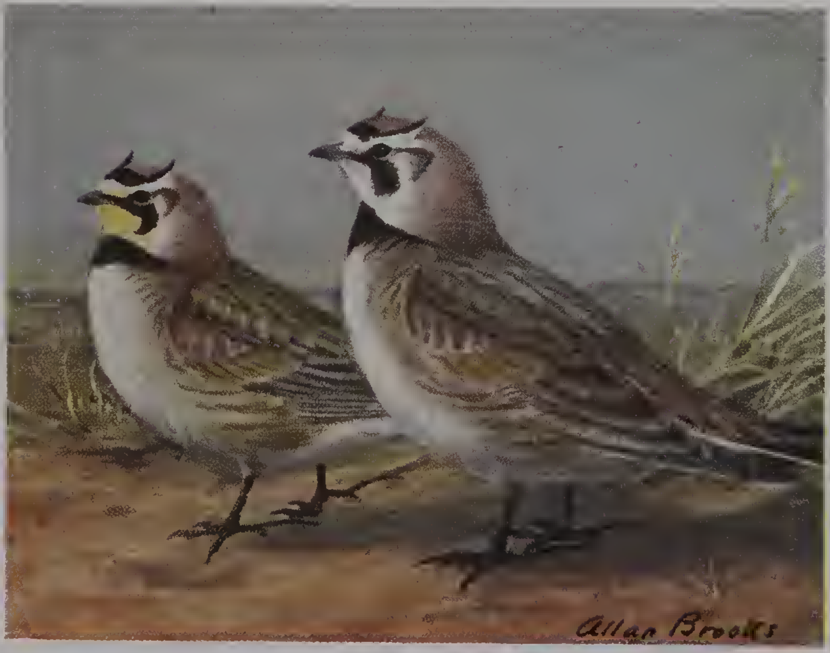
Much as this obscure little bird resembles the Least Flycatcher, it is still more like Wright's and the wing formula (Figure 249 b) is the only certain distinction between them. In breeding season, it is a bird of the higher elevations, and not such a shade lover as the latter species. It will take the very closest observation and the collection of many specimens to establish the eastern boundaries of its range.

469. **Wright's Flycatcher.** *Empidonax wrighti.* L, 6. A little larger in length than Hammond's Flycatcher, and smaller than Traill's. Of general colour design of dusky olive and white like the Wood Pewee (Plate XLII A), but smaller.

Distinctions. Almost identical in colour with Hammond's, but averaging a little longer, with less greyish over throat and breast and approaching the Least in this character, but very variable. Best separated from the other similar little green Flycatchers by the first



A. Western Wood Pewee; scale, $\frac{1}{4}$



B. Horned Lark; scale, $\frac{1}{3}$

Desert Horned Lark Pallid Horned Lark

primary being shorter than the sixth (Figure 249 a), a character only shared by the Western Flycatcher. There is a yellowish phase of this species and Hammond's, in which the underparts approach the yellowness of the Yellow-bellied and Western Flycatchers.

Field Marks. A very small obscurely coloured Flycatcher, difficult of separation from the Least and Hammond's. In the breeding season it is a bird of lower levels than the latter, inhabiting elevations below 3,000 feet. It is usually a shade lover, and most often seen in second-growth thickets and brush. It does not seem to have any very distinctive notes—a soft *"swit"* is the commonest, whilst others are reminiscent or so suggestive of calls of other species as to make identification by the notes uncertain.

Nesting. Nest of fibres, bark strips, etc., softly lined, in upright crotch, usually low down.

Distribution. Western North America from southern British Columbia to New Mexico. In Canada, southern British Columbia, east probably to western Saskatchewan. Its eastern range has not been very well defined.

Very closely resembling the Least Flycatcher and Hammond's and the wing formula (Figure 249) is probably the best distinction. It will take the closest observation and the collection of many specimens, to define, with accuracy, the overlapping ranges of these species.

SUBORDER—OSCINES. SONG BIRDS

The suborder *Oscines* is a large division of birds, placed at the head of the list as exhibiting the highest development of the class *Aves*. It includes a great number of families and species, the exact relationships of many of which have never been satisfactorily defined. According to present American usage the suborder begins with the Larks and ends with the Thrushes which are regarded as constituting the most highly developed family. The characters differentiating the *Oscines* from the *Clamatores* are technical and anatomical and beyond the scope of a popular consideration of the subject. As might be gathered by the name the high development of the vocal organs and muscles attached is an important point in the classification. The members are more easily recognized from family descriptions than under this more general heading.

FAMILY—ALAUDIDAE. LARKS

The Larks comprise a large family of wide distribution. The systematic distinctions that characterize the family are rather technical, and as there is only one species in Canada to consider, they will be described under the species in the following pages.

474. **Horned Lark** (Including **Eastern, Prairie, Hoyt's, Desert, Pallid,** and **Streaked Horned Larks**). SHORE LARK. *Otocoris alpestris.* L, 7·75. Plate XLII B. A ground bird, approximately of the size of a Sparrow; greyish pink or light brownish above; white below with black gorget, facemark, and forehead; and white or pale yellow throat.

Distinctions. The long hind toe nail (Figure 250 b) is one of the distinctive marks of the true Larks, but is shared by the Titlark and the Longspurs. The latter, however, are Sparrows with typical conical bills, and very different from the Larks. The yellow or creamy throat, black gorget, and erect, horn-like black ear tufts are distinctive of the Horned Lark (Figure 250 a).

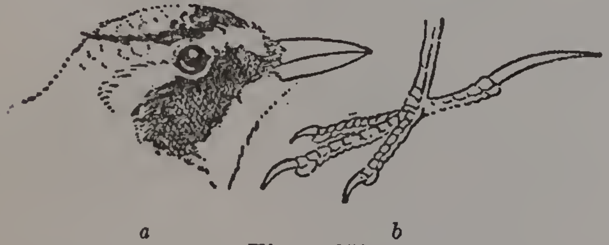


Figure 250
Horned Lark, showing long hind claw; natural size.

Field Marks. Ground-frequenting habits, often in large flocks; extensive white below, erectile horns, and black gorget with white or pale yellow throat.

Nesting. On the ground in the open. Nest of grass in small, natural hollow. Often amidst the snowdrifts of early spring.

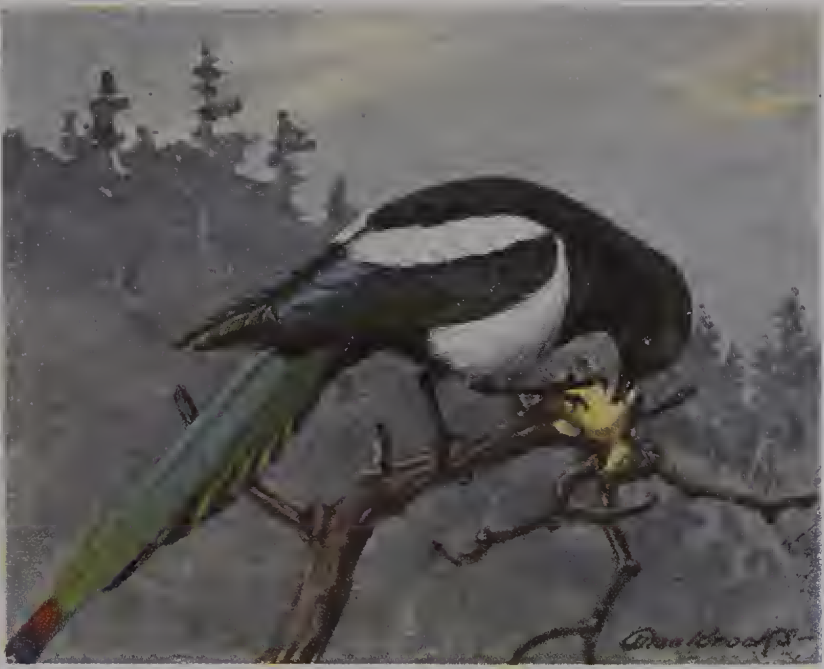
Distribution. North America, Europe, and Asia. In Canada, all open country north to the Arctic ocean and irregularly over the islands beyond.

SUBSPECIES. Few birds have been divided into as many, or as puzzling, subspecies as the Horned Lark. In Canada, we have a Northern and Southern series of subspecies distributed across the continent, the northern ones being, in each case, slightly but consistently larger than their southern neighbours. Across the more southerly parts of Ontario and Quebec we have the Prairie Horned Lark *Otocoris alpestris praticola*, extending westward into Manitoba. This is a small, moderately pale bird; line over eye and forehead, white; throat pale yellow, sometimes white. North of this subspecies is the type form, the Eastern Horned Lark *Otocoris alpestris alpestris*. Slightly larger and more robust, all the colouring stronger, and the eyebrows, forehead, and cheeks distinctly yellow. This bird migrates irregularly through the southern parts of the eastern provinces, and occasionally through Manitoba. West of the range of the Prairie Horned Lark is the Desert Horned Lark *Otocoris alpestris leucolaema*, of the same small size as the Prairie Horned Lark, but decidedly paler, the vinaceous of the upper parts is reduced to pinkish, and the brown back stripings are largely concealed with greyish. Throat, yellow or white. This form occupies most of our central prairies and southward. Some authorities divide this into two races, the northern of which enters Canada and is known as the Saskatchewan Horned Lark *Otocoris alpestris enthemia*, but it has not been accepted in the Check-list. North, along the central Arctic coast and extending eastward in the islands above, is Hoyt's Horned Lark *Otocoris alpestris hoyti*. It approximates the large Eastern Lark in size, but the forehead, eyebrow, and face are white. The throat may be pale yellow or white. In summer, the body colours are bright and contrastive, with much strong ruddy. In migration season it is much like the Prairie Horned Lark, but larger. It migrates through the Prairie Provinces. In the lowlands of southern British Columbia the Dusky Horned Lark *Otocoris alpestris merrilli* is a rather rare summer resident. It is a small dark form very similar to the Prairie Horned Lark, but usually with a yellowish eyebrow, and is far removed from that race geographically. At higher elevations through British Columbia and lower in Yukon and Alaska, is the Pallid Horned Lark *Otocoris alpestris arcticola*. It is another large race, paler than the Dusky, the Prairie, or Hoyt's, but darker than the Desert. The throat is always white. In size, it agrees with Hoyt's and the Eastern Horned Larks. It migrates throughout the prairies, perhaps as far east as Manitoba. East of the Coast range in southern British Columbia the Streaked Horned Lark *Otocoris alpestris strigata* may be found. It is the smallest of our Canadian Horned Larks, and the darkest and reddest in colour, with underparts usually showing faintly yellow below the black gorget.

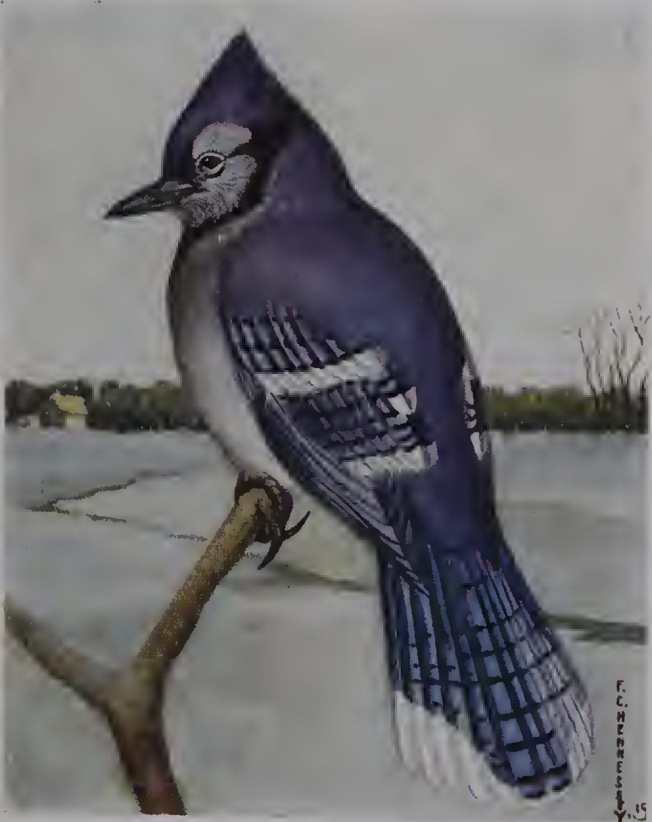
The differences between some of these races is not very marked and even the expert must have an ample series of specimens for comparison before making decisive identification. The differences may not average more than half an inch in total length, even in characteristic birds of comparable age and sex. Intermediates are common and individual variation is considerable. In migration, many wander far from their breeding homes and mix together, and, in some cases, late migrants do not leave southern stations before resident birds are rearing young. In the mountains, forms may be separated by no more than altitude and but a few miles of territory. All of these factors tend to make rules on identification and ranges of the forms of this species a difficult matter, and may require constant revision of opinion until much more work has been done and more complete series of specimens are available for examination and comparison.

The Horned Lark is a bird of the open, frequenting bare fields, beaches, or roadways. In the winter, the seeds of weeds projecting from the snow are its main food supply, and numbers frequent travelled roads for the partly digested grain dropped by the horses. Occasionally large winter flocks appear. It is in such migrant congregations that the rarer forms should be looked for.

PLATE XLIII



A. Magpie; scale, $\frac{1}{5}$



B. Blue Jay; scale, $\frac{1}{3}$

FAMILY—CORVIDAE. JAYS AND CROWS

The Crow family is very large and diverse, including many beautiful and highly coloured birds; indeed the famous Birds of Paradise are closely related to this family. The bill (Figures 251, 252) is the most easily distinguished character. It is moderately long and stout with a well-arched culmen. At the base are tufts of dense, stiff, bristle-like feathers pressed close to it and covering the nostrils. The Woodpeckers and the Titmice have a suggestion of these nostril tufts, but the latter are all very small birds and the former have a straight culmen and the bill chisel shaped at the tip (*See* Figure 241a). They are not songsters in the ordinary sense of the term; their voice is hoarse and raucous, but the complexity of their vocal organs is very great and some of them can be taught to articulate words. They are amongst our most intelligent species and by some authors have been put at the head of the whole avian list.

Subfamily—Garrulinae. Magpies and Jays

Medium-sized birds, many of them brilliantly coloured and with ornamental crests and flowing tails. They can be most easily recognized under their specific headings.

475. **Magpie** (Including **American Magpie**). *Pica pica.* L, 15·20 (Tail 10). Plate XLIII A. A large appearing, very long-tailed bird, spectacularly coloured in black and white.

Distinctions. With large size, long, sweeping tail, and intense black and white contrasts, mistakable for no other Canadian bird.

Field Marks. Showing distinctions as above.

Nesting. An enormous mass of sticks in lower branches of trees or bushes, with nest in centre, entrance and exit in opposite sides.

Distribution. Europe, northern Asia, and western North America. In America, west of the Great Lakes from middle Yukon to New Mexico. In Canada, common on the southern prairies, in the bluffy country adjacent, and in southern British Columbia, except the coast district. Occurs erratically north and eastward. Apparently extending its range in these directions.

SUBSPECIES. The American Magpie *Pica pica hudsonia* differs from the Old World form only slightly in plumage characters, but very much in voice.

One of the most spectacular, beautiful, and interesting of western birds, but a considerable pest for all that. It is more often seen retreating up the coulée, chattering as it glides from bush to bush, its broad showy colour surfaces in brilliant contrast with the dark green background. At other times, a small flock or family party will be seen passing noisily along the tops of the hills, from brush clump to brush clump. Again, they steal silently into camp or about the farm buildings intent on any mischief that may present itself, but flee away in consternation when disturbed, and talk the matter over in loud raucous voices in the nearest safe shrubbery. The Magpie cannot remain hidden or silent long, except when up to mischief. For purposes of brigandage and rapine they can contain themselves admirably but just long enough to accomplish their schemes. In all, the Magpie is a bird amply able to take care of itself, and such a handsome, knowing, and resourceful fellow, that he almost disarms justice. From all accounts, the Magpie is extending its range both northward in Alberta and eastward into Manitoba. Stray records of the species have been made east into Ontario, and north into the Mackenzie country. Wherever it goes, it is the same unscrupulous roysterer, perfectly confident in its ability to take care of itself, though surrounded by enemies, its hand against everybody and every hand against it. But, when it does lose the game, and finds its wits fatally outmatched, it is a bad loser, and has no shame in showing its terror and calling loudly on the whole world to witness the unprecedented outrage.

Economic Status. Next to the Crow, and possibly before it, the Magpie is the most persistent nest robber in the bird world. No eggs or young birds are safe from it, and where it is numerous it is one of the important determining factors in limiting the increase of the smaller birds. It even enters poultry yards and hencoops, timing its visit nicely when the owners' eyes are turned elsewhere, and chicks and eggs are its prey. Occasionally it attacks horses and cattle, even to their death, perching on the foolishly unresisting animals' backs and enlarging saddle galls, fresh brand marks, or other open sores to serious proportions. The animals, for some unaccountable reason, seem to make no objection, and even appear to enjoy the sensation of being pecked to death. A few Magpies may be a picturesque accompaniment of the landscape, but even those can only be enjoyed at a price, and certainly any great number of them in a neighbourhood are to be discouraged by the use of gun and trap.

477. **Blue Jay.** *Cyanocitta cristata.* L, 11·74. Plate XLIII B. A bird about the size of a Robin, sky blue on back, wings, and tail; a conspicuous pointed blue crest. Nearly white below; and a black necklace draped around neck and over the upper breast (Figure 251).

Distinctions. Large size, general sky-blue colour, and prominent, upstanding crest. Not likely to be confused with any other species, except Steller's Jay, which is very different, being much darker all over, with a black head, and deep blue back and underparts.

Field Marks. Distinctions as above, and characteristic cries and calls, the most common of which is a loud, "*Jay – – jay– –jay*", another resembles the squeak of a rusty hinge, but the bird is a mimic, and acquires many strange notes.

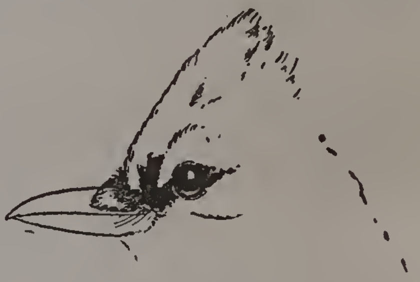


Figure 251
Blue Jay; scale, about ½.

Nesting. Nest of twigs and rootlets in trees.

Distribution. Eastern North America, from the northern coniferous forest, south to the gulf of Mexico. In Canada, west to the foothills.

SUBSPECIES. The Blue Jay that occupies most of the continent, except Florida, is the type form, *Cyanocitta cristata cristata.*

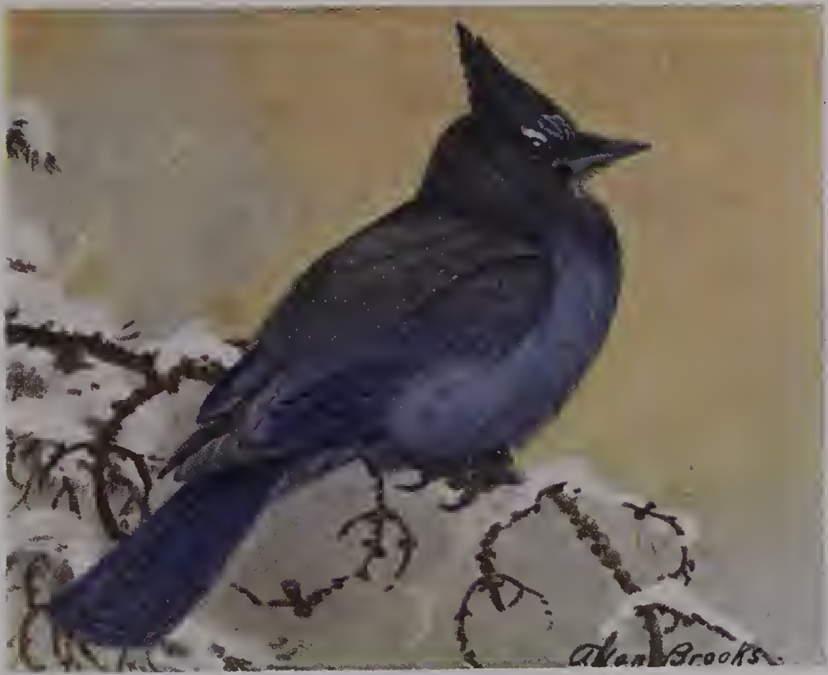
The Jays are all much alike in their nature. They are clowns, intelligent, alert, inquisitive, mischievous, and noisy. Much said of the Magpie applies, in a measure proportionate to its size, to both the Blue and Steller's Jays. The gay coat of the Blue Jay, and its knowing airs, disarm criticism.

Economic Status. Economically the Blue Jay occupies a doubtful place; in food habits it is omnivorous, eating in turn, insects, fruit, acorns, grain, eggs, or young birds. Undoubtedly acorns, in their season, form its staple food. It is a bird that should be discouraged where other more useful birds are nesting.

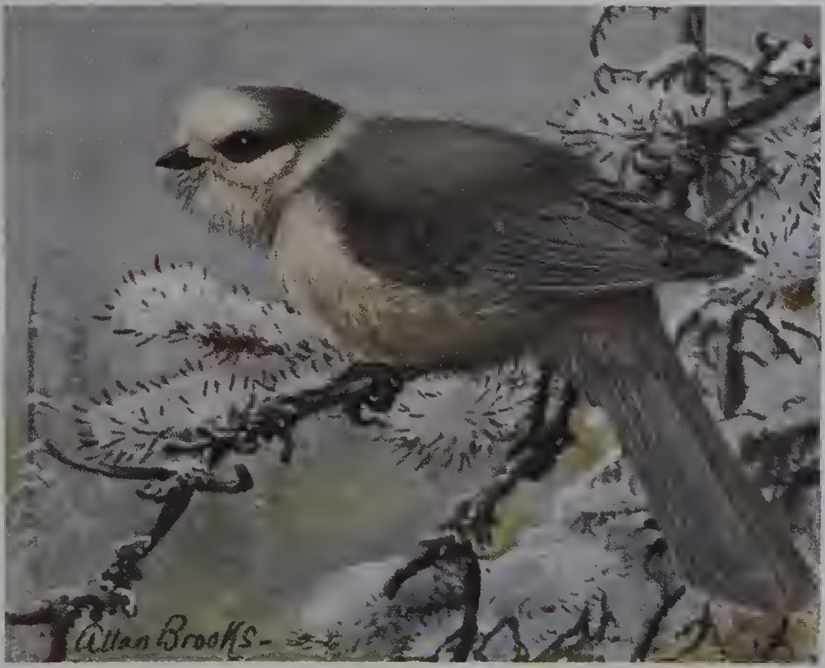
478. **Steller's Jay** (Including **Black-headed** and **Queen Charlotte Jays**). (Incorrectly BLUE JAY.) *Cyanocitta stelleri.* L, 12·50. Plate XLIV A. Somewhat larger than a Robin. Back, wings, and tail, dark blue, gradually turning to black on head. Conspicuous pointed crest.

Distinctions. Large size, general dark blue colour, black head, and prominent upstanding crest. Not to be confused with any other species except, perhaps, the Blue Jay, but quite different, being dark blue instead of sky blue with white abdomen.

Plate XLIV



A. Steller's Jay; scale, $\frac{1}{4}$
(Black-headed Jay)



B. Canada Jay; scale, $\frac{1}{3}$
(Eastern form)

Field Marks. Distinctions as above, and loud, characteristic voice. Steller's Jay, Clarke's Nutcracker, and the Magpie all have an extended vocabulary with much in common. The most usual call of this species is a harsh "*Shaack-shaack-shaack*" or "*Chack-ah, chack-ah, chack-ah,*" quite different from the clear "*Jay-jay-jay*" of the Blue Jay.

Nesting. A bulky mass of twigs lined with mud and rootlets, usually in evergreen thickets.

Distribution. Western North America from Alaska to Central America. In Canada, east to the edge of the plains. Occasionally in Saskatchewan.

SUBSPECIES. Steller's Jay is divided into a number of subspecies, the following of which occur in Canada. The typical form, *Cyanocitta stelleri stelleri*, is the bird of Vancouver island and coast from Cook inlet, Alaska, to Oregon. The Queen Charlotte Jay *Cyanocitta stelleri carlottae* is confined to Queen Charlotte islands. The blues are darker, and the black is deeper and more extensive. The Black-headed Jay *Cyanocitta stelleri annectens* is the bird of the interior. It is most like the typical form, but on an average has more decided whitish blue streaking on the forehead, and usually has a silvery grey spot over the eye. These characters are not constant, however, some coast birds having considerable forehead streaking, and many interior ones having no spot over the eye.

A true Jay in all its habits, ways, and actions. All said of the Blue Jay will apply to this species, but, it being more numerous in its natural habitat, must be considered more seriously.

484. **Canada Jay** (Including **Rocky Mountain Jay** and **Grey Jay**). WHISKEY JACK. MOOSE-BIRD. CAMP ROBBER. MEAT-BIRD. *Perisoreus canadensis.* L, 13. Plate XLIV B. About the size of a Robin; soft, plumbeous ash; head, throat, and breast white, with dark cap over rear crown and nape.

Distinctions. Size of Robin. Body a soft neutral grey colour, without pattern, and a very loose, fluffy plumage. A dark cap and white forehead, face, and throat. The juvenile has an evenly dark, almost black, head and neck.

Field Marks. Size; in adult, uniform grey coloration, and white forehead and face, with dark cap or nape. Juveniles have an almost black head and face, gradually greying above and below towards tail.

Nesting. A deep nest of twigs and fibres, thickly lined with fur or feathers, in dense coniferous trees. Eggs deposited very early. In northern Manitoba, eggs have been recorded in January, with official thermometer registering fifty degrees below zero.

Distribution. The northern coniferous forest of North America. In Canada, across the continent, coming south along the mountains.

SUBSPECIES. The race that inhabits the greater part of Canada is the Northern Canada Jay *Perisoreus canadensis canadensis.* In the mountains, south from central British Columbia, except near the coast, is the Rocky Mountain Jay *Perisoreus canadensis capitalis*, characterized by slightly lighter general coloration and the extension of the white forehead on the crown, reducing the dark cap to little more than a nape bar. On Vancouver island and the adjoining coast is the Grey Jay, given in the Check-list as *Perisoreus obscurus griseus*, and accredited full specific distinction, but, as intergrades can be demonstrated, in the opinion of the writer, worthy of only subspecific status.

It is characterized by slightly brownish coloration and in having the feathers of the back distinctly white-shafted.

If the other Jays are clownish, one scarcely knows how to characterize the Canada Jay. It has all the family characteristics in an exaggerated form, but seems to lack the keen appreciation of its own humor that the others possess. Its entire lack of self-consciousness or poise is notable, and it does the most impudent things with an air of the most matter of fact innocence. No sooner is the camper's fire lighted than the Whiskey Jack is on hand for any good thing that may come its way. Almost before the echo of the rifle has died on the hills, he is in at the death to share in the offal of the game. Food on the camp table, bacon in the frying pan, or even soap by the wash dish are never safe from it, and if any little thing is missing in camp, its absence can well be blamed on the Whiskey

Jack. The tent has to be tightly closed against its sharp eyes and inquisitive bill. Yet it does little real harm, its confiding presence is always welcomed, and its petty pilferings usually laughed at. Few wild things have as many human friends in the woods as this bird. It probably has the usual Jay fondness for eggs and young birds, but it does not flaunt its vices in our faces, and when man is present, devotes all its attention to salvaging waste scraps from camp. Though always present about camp, its total numbers are never large, and its population seems to consist of single families evenly scattered over the wildest country. A peculiar thing about it is that, whereas other Jays increase rapidly under cultivated conditions, the Canada Jay shrinks from civilization. Lonely places are its favourite haunts, and as soon as the temporary camp becomes a permanent settlement, it deserts the neighbourhood and retires to more secluded localities, or possibly suffers the fate resultant on too great confidence, for often civilized man is more intolerant of wild life than are more primitive hunters and trappers.

Economic Status. No definite study has been made of the food of this species. Its habits, when under observation, show it to be omnivorous; probably its food is much similar to that of the other Jays, but its habitat removes it from close contact with man, and its comparatively small numbers make its effects economically unimportant.

486. **Raven** (Including **Northern Raven**). *Corvus corax.* L, 22. An entirely black bird, like a Crow (Plate XLV A), but decidedly larger.

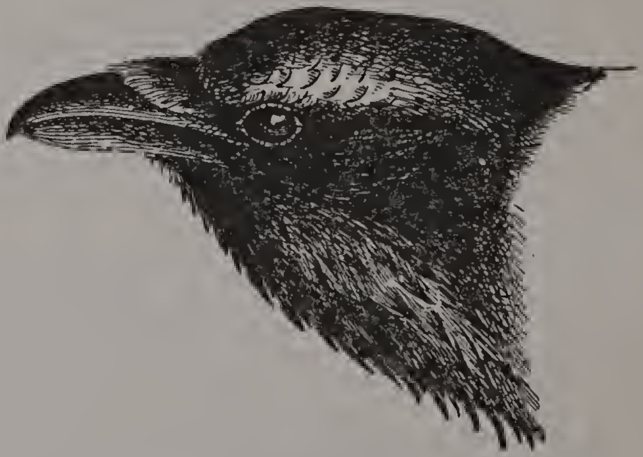


Figure 252
Raven, showing lanceolate feathers on throat;
scale, ½.

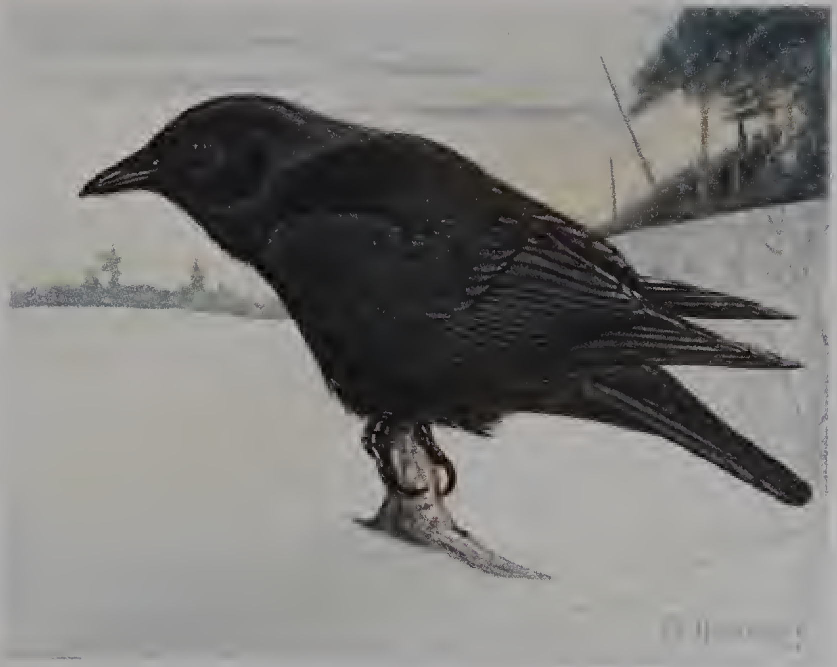
Distinctions. Like a very large Crow, with wing over 15·5 inches long. The most obvious distinction, other than size, is the long-pointed, lanceolate feathers on the throat, each lying separate, one on the other, and not softly blended as in the Crow (Figure 252).

Field Marks. Next to size, which is always an uncertain guide in open spaces, the voice is the most certain distinction. The raven croaks instead of caws. The voice is hoarse and rattling, with a wooden quality. Young Crows sometimes have raven-like notes, but usually the voices of the two species are perfectly distinctive. The flight of the Raven is more dignified and impressive than that of the Crow, slower in beat, and with more sailing. It is sometimes very playful in the air, and executes many aerial manoeuvres.

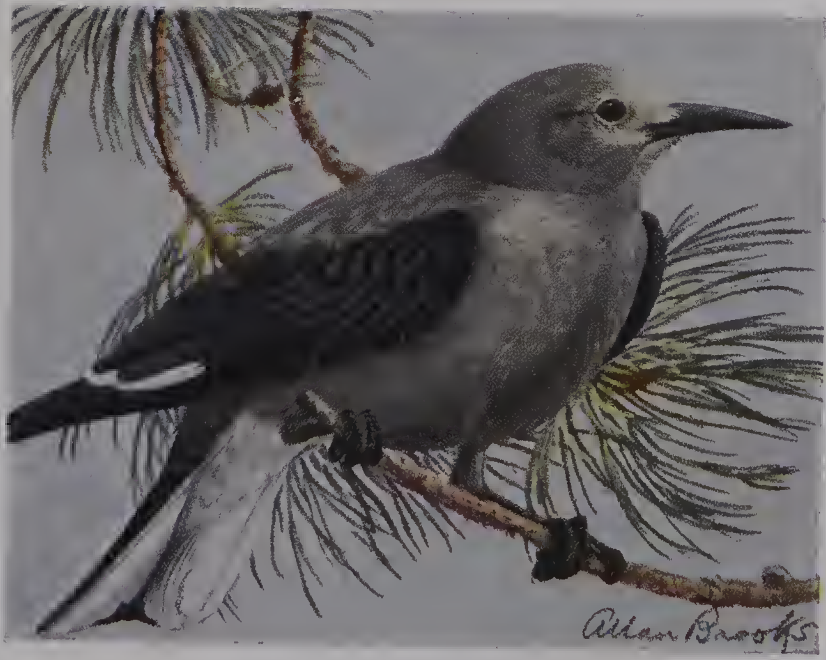
Nesting. Large nest of sticks, usually on cliff ledges; sometimes in trees.

Distribution. Europe, northern and central Asia, and North America. In Canada, across the continent. It has disappeared or is now disappearing from most of the settled parts.

PLATE XLV



A. American Crow; scale, $\frac{1}{5}$



B. Clarke's Nutcracker; scale, $\frac{1}{3}$

SUBSPECIES. We have only one recognized subspecies of Raven in Canada, the Northern Raven *Corvus corax principalis*, that extends north over the Arctic islands. It differs from a more southern form in the interior of the continent by slightly larger size and heavier build.

The Raven is traditionally a bird of ill-omen. Sombre of colour, dismal in voice, solitary and wild of habit, it fills in the far north the place of the Vulture in the south. The Raven holds aloof from the haunts of men. As civilization has advanced into the primeval vastnesses, the Raven, unlike its close relative the Crow, has retired and is still today what it was in the beginning, a bird of the wilderness. Knowing only the physical requirements and food habits of the two species, one would naturally think that the Raven could thrive as well under civilization as the Crow. It is omnivorous and can adjust itself to almost any food supply. It is hardy and can live in climates and under severer conditions than its congener, yet for some unexplained reason, the Crow increases and the Raven disappears when settlement advances.

Economic Status. The Raven eats both animal and vegetable food, but has a strong partiality for the former. It seeks the offal from the hunter's dressed game, or the game itself if it be available. It lurks about the outskirts of rookeries and makes dashes for eggs and young. By the sea it searches the shores at low water for crabs and other sea life and for anything edible that may be washed up. Avoiding cultivation as it does it has little direct economic influence.

488. **American Crow** (Including **Western** and **Northwestern Crows**). *Corvus brachyrhynchos.* L, 17. Plate XLV A. A large, all black bird, too familiar to need much description.

Distinctions. A large bird, jet black all over, with considerable metallic iridescence. To be confused only with the Raven, but smaller, and the throat feathers blend together in a smooth, even mass, instead of standing out one from the other in sharp-pointed lanceolate individuality (Compare with Figure 252).

Field Marks. Large size, solid black coloration, distinctive wing action, and familiar voice.

Nesting. Nest of sticks in trees.

Distribution. All temperate North America.

SUBSPECIES. The Eastern Crow *Corvus brachyrhynchos brachyrhynchos* is the east Canadian form, extending westward into Manitoba. From here to the coast district of British Columbia it is replaced by the Western Crow *Corvus brachyrhynchos hesperis*, which is identical in colour with it, but averages slightly smaller. The difference in size is not great and many specimens cannot be referred to their expected appropriate geographical race by any test. On the coast is the Northwestern Crow *Corvus brachyrhynchos caurinus*, hitherto commonly regarded as a separate species, but lately officially reduced to subspecific status. Its only outward distinction is its much smaller size. A male with wing under 12 inches, or a female with wing 11 inches or under, should be of this race.

Although the Raven retreats before the advance of civilization, the Crow increases. It is omnivourous, feeding readily on anything from carrion to sprouting corn. It is an open-country bird and probably arrived in eastern Canada about the time of the first white man's clearing of the forest. In the west, where prairies and open spaces were the original condition of the country, it probably has always occurred, but it has increased enormously with cultivation. Over the colder sections of its range it is a migrant, though, locally, many birds may be induced by the abundant food supply furnished by slaughter houses and garbage dumps to winter far north of their accustomed range. Probably its great increase in numbers in western Canada is due as much to the present greater winter food supply in its southern stations as to summer conditions within our borders. Food in summer on our prairies was probably always sufficient for many more Crows than originally occupied them, but their numbers were controlled by the scantiness of the winter supply. Nowadays, with much of the great southern interior under cultivation, undoubtedly many more can find support through the winter and return in the spring. As far as the Crow is concerned, the primitive "balance of nature" has been profoundly and irrevocably changed in its favour, and it has increased abnormally. A policy of non-interference, as is advocated by many nature lovers, would, of course, eventually permit a new balance being established, but it would not be the original one and under it the Crow would be more secure than under primitive conditions. It is for us to consider whether such a consummation is desirable.

Economic Status. The economic status of the Crow is a much argued question. Sentimental enthusiasts and some cautious agricultural investigators regard it as a valuable species. Others, perhaps equally prejudiced in the opposite direction, refuse to admit any good in the black robber. The actual fact probably lies within these extremes. In 1895 a study of the "American Crow in Relation to Agriculture", by W. B. Barrows and E. A. Swarz, was published as Bulletin No. 6 of the United States Department of Agriculture. It was a brochure of nearly one hundred pages, based on almost a thousand stomach examinations and on testimonies from all over North America. Again in 1918, the subject was rediscussed in "The Crow in Its Relation to Man," by E. R. Kalmbach, Bulletin No. 621 of the same Department. The new findings were based on 2,118 stomachs, much new field work, and the replies from some 3,000 letters of inquiry. The results of the two investigations do not differ materially, but the latter author gives a very guarded approval of the Crow. The insect food throughout the year is given as 18·97 per cent of the whole, grasshoppers and May beetles being prominently represented, especially during certain months. Carrion and animal matter, 9·15 per cent; grain, mostly Indian corn, 51·12 per cent; fruit, mostly wild, 17·70 per cent; and weed seed and rubbish, 3·06 per cent. In the east, the Crow is condemned mostly as a grain eater; in the west, complaints of this nature are few and in any event, Indian corn is not an important crop there. It is notable that much of the "other grain" is taken in early spring months when it is obviously waste. On the other hand, from May until the end of August, the Crow makes a striking record as an insect consumer. During these months, insects average 36 per cent of its food, of which, during August and September, grasshoppers constitute 19 per cent, and in May, May beetles, over 10 per cent of the total. Nineteen per cent of the food of so large and common a species as the Crow is an important economic item. When it is noted that these figures are for the average of North America and mostly where grasshoppers are but incidental and not unduly numerous, it is evident that the benefit that may be derived from the species is well worth considering. Undoubtedly, the Crow's worst enemies will admit that, where grasshoppers occur in pestilential numbers, the Crow subsists upon them almost entirely. The writer has seen the ground under Crow stations covered with the ejected pellets composed entirely of the horny, undigestible parts of grasshoppers. No less convincing an observer than Mr. Norman Criddle of Aweme, Manitoba, studying the grasshopper pest for the Entomological Branch of the Dominion Government, cites cases where land protected by numerous Crows escaped serious damage, but adjoining localities, where they had been lately systematically shot, were devastated by grasshoppers. Based on stomach examinations, usually the most reliable evidence on the subject, and from a purely agricultural standpoint, it seems that a very good case can be made for the Crow in the Canadian west. It does not seriously affect grain and does good duty in controlling some of the worst insect pests the farmer has to contend with. But there is another side to the story, and one that stomach examination does not usually show.

As an egg eater and a young bird destroyer, the Crow is probably the very worst enemy of some of our largest and most useful wild birds. Throughout the spring and early summer, before grasshoppers are out in number, the Crow in the west makes its worst showing, and one that, in the eyes of many, cancels all the good it may do at other times. In the itemized tables given by Mr. Kalmbach, animal matter other than insects and carrion constituted over 10 per cent of its food for May, June, and July. In this, however, no account can be taken of the enormous number of eggs consumed during this time, as they seldom leave any record in the crop or stomach for subsequent recognition. Field observations show that Crows destroy an astonishingly large proportion of the eggs of water fowl and upland game. Probably in many cases of the first layings of these birds scarcely one out of four is brought to hatching. Later broods, when the cover is better grown, fare better, but even they suffer severely and in any event several weeks are lost of the precious summer in which to mature and harden the young generation in preparation for the hardships of migration and winter. It is nothing uncommon to see newly hatched broods of ducks as late as the end of August, the results of several interruptions to breeding. Of course, all the nest destruction cannot be blamed on Crows. Coyotes, dogs, cats, the trampling cattle, and other factors are also to a greater or less degree responsible. But taking such evidence as the culprit leaves behind, it is only too evident that the Crow is the cause of the larger proportion of loss. A dozen nests may be found occupied one day and destroyed the next, with suggestions or evidence of Crows about them. A Duck or Prairie Chicken flushed from the nest in sight of the ever vigilant marauder puts him at interested attention immediately, and if watched, he will be seen to investigate the promising spot as soon as the intruder has left. Crows also profit by disturbances in large nesting communities, such as of Gulls or Terns, that cause the owners to leave their premises temporarily unguarded; later examination generally shows the clean sweep they make on the opportunity. During the nesting season they hunt indefatigably for eggs and seem to favour them above all other food and the thoroughness with which they search all possible grounds only raises wonder that any are left to hatch. However good the Crow may be as an insect destroyer, it is doubtful if it can, in this direction, replace the birds that it supplants. It will certainly take a number of Crows to replace the work of a covey of Prairie Chicken that one Crow has destroyed, and when the great number of other birds so lost are taken into consideration, it is very questionable how far, if at all, the evidence is in its favour. In the case cited by Mr. Criddle, it may be held that the crows had already eliminated the majority of other grasshopper destroyers before they were themselves killed off. Such things as these cannot fail to impress the unprejudiced observer, and when he marks the dearth of bird life in situations that seem most favourable, but where Crows and Magpies are numerous, he cannot help but add reservations to his acceptance of official findings that do not take them into consideration.

Altogether, in the view of the writer, the Crow is pretty nearly as black as he is painted. The fact that Mr. Kalmbach rather withholds judgment, and gives modified approval when the most adverse factors are unrepresented in his evidence, suggests that, when all things are considered, the Crow will be placed in the category of the undesirable. Certainly there is no call to protect the Crow. It is wary, intelligent, adaptive, and well able to survive even if every man's hand is turned against it. The most strenuous efforts practicable will never imperil the species. As for active methods of control, probably the least satisfactory and most expensive one is the bounty system. From a purely agricultural point of view, the status of the Crow in the west is doubtful. At the best, it is mildly beneficial, at the worst, but neutral. The Crow question becomes, therefore, one for the sportsman rather than the farmer. The policy of public bounties and taxing the general public for the benefit of a particular class is a questionable one. Could it be regarded as a permanent investment, if the species would stay reduced when once brought to a normal number, it might be differently viewed and the expense justified as for the general good. But the relief is only temporary and unless continued year after year as a running expense, is of no permanent benefit. It behooves the sportsman to protect his own sport and to take the burden of controlling one of the worst game destroyers.

491. **Clarke's Nutcracker.** CLARKE'S CROW. *Nucifraga columbiana.* L, 12·50. Plate XLV B. A heavily-built jay-like bird without crest, uniformly smoky grey body, slightly whitening to face, with black wings and centre tail feathers. Extensive white tips to secondaries and white outertail feathers and undertail coverts.

Distinctions. The Shrikes are the only species this bird resembles in colour, but the Nutcracker is much larger and has no black bar through eye (Compare with Plate LXVI A).

Field Marks. A large grey bird, with black wings and much white in tail. Of Jay-like habits, and very noisy and talkative.

Nesting. Nest a large structure of sticks in the lower branches of conifers on the mountain sides.

Distribution. Western North America. In Canada, throughout the mountain regions from Alaska through British Columbia, south mostly east of the Coast range. East, casually as far as Saskatchewan.

Clarke's Nutcracker, named after the junior leader of the Lewis and Clarke expedition that first brought the species to the attention of science, is one of the most interesting birds of the mountains. It comes into camp almost as freely as its relative, the Canada Jay or Whiskey Jack, and like it in some localities is called "Camp Robber." It is a very noisy and talkative bird, with many queer antics. One of the best places to study this species is in the Banff National park. Here almost any morning in summer its harsh voice is one of the first sounds that steals in through the bedroom windows and by following the sound, one may soon come upon a small party performing their peculair gymnastics and loudly discussing neighbourhood topics in the evergreens near at hand.

FAMILY—STURNIDAE. TRUE STARLINGS

The True Starlings constitute an Old World family separated from the American Starlings by having, among other distinctions, ten instead of nine primaries. In the only species here considered, an introduced species, the first primary is rudimentary.

Introduced:

Chinese Starling. Japanese Starling. MYNAH. *Acridotheres cristatellus* L, 10·50. A very dark, nearly black bird, about the size of a Robin, with large white patch at base of primaries and secondaries; a standing crest at base of bill and over eyes; bill and legs yellowish (Figure 253).

Distinctions. A rather large black bird, with much white on wings, yellow bill rose coloured at base, and orange-red feet; an upstanding crest of lanceolate feathers at base of bill, covering nostrils. Not likely to be mistaken for any other species of probable occurrence in Canada.

Field Marks. A black bird about the size of a robin with conspicuous white patches on wings, yellow eyes, pale yellow bill, and red-orange legs. It has a far-reaching, melodious whistled call, that can be heard above the roar of traffic in the crowded city streets.

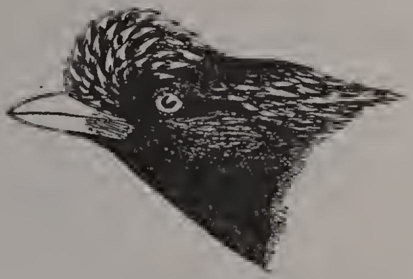


Figure 253
Chinese Starling; scale, ½.

Distribution. Central and southern China. Supposed to have been introduced into the Philippine Islands. Introduced in British Columbia at Vancouver and now well established there.

The origin of the introduction, and the exact date, are unknown. It is supposed that they were originally escaped cage birds. At any rate, they are now well established about Vancouver, and are spreading without the environs. What their effect will be, cannot be predicted. The introduction of a nearly allied Mynah, *Acridotheres tristis,* in the Hawaiian islands, has not produced the desired results. At the best, it can only increase at the expense of some native species with which it comes into competition, and even if no worse effects follow, that will be enough to condemn it in the eyes of most of us. Outside of game birds, there do not seem to be many cases where the introduction of foreign species of birds has had a happy ending. Usually introduced species fail to obtain a footing, or succeed too well, and either develop bad habits, or replace native species of sentimental or economic value. Both the Canadian and the United States governments have prohibited the introduction and acclimatization of foreign species, and issued regulations controlling the practice; and it is hoped that no more species will be introduced. No introductions may now be legally made without special permits from the respective governments. This may not prevent such an accident as seems to have established this species with us, but will at least prevent our knowingly importing such pests as the English or House Sparrow.

FAMILY—ICTERIDAE. AMERICAN STARLINGS

This family includes the Blackbirds, Orioles, and Meadowlarks, which are the American representatives of the European Starlings. They are closely related to the Sparrows and clear differentiation cannot be made between them in a popular description. Most of them have rather long, pointed, tapering bills (Figures 256–258) and some have the middle of the culmen running up in a short keel on the forehead. The Bobolink and the Cowbird have quite sparrow-like bills (Figures 254 and 255), but they are shortened Icterine rather than Passerine bills. These species can also be separated easily by their marked colour patterns.

494. **Bobolink.** SKUNK BLACKBIRD. *Dolichonyx oryzivorus.* L, 7·25. Plate XLVI A. A little larger than a House Sparrow with a sparrow-like bill (Figure 254). Spring male: striking black and white with a cream-coloured nape and hindneck. Female and autumn birds of both sexes: buffy-yellow, striped with dark brown on back.

Distinctions. The spring male has a slight resemblance to the male Lark Bunting, but is white on the shoulders and rump instead of on the wings, and there is a large cream-coloured area on the hindneck. Females, juveniles, and autumn birds of both sexes are entirely different and might be taken for another species at this season. They resemble the Sparrows in general coloration, especially the Longspurs, and particularly the autumn Smith's Longspur. However, the tail of the Bobolink is composed of stiff, pointed feathers and shows no white, and the general colour is yellowish and olivaceous rather than brownish.

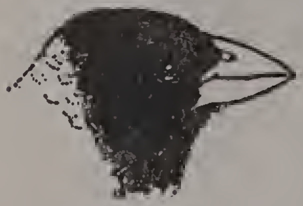


Figure 254
Bobolink; about natural size.

Field Marks. The striking black and white male and his ecstatic flight song are perfectly distinctive. The Lark Bunting has a remarkable flight song also, but white is restricted to the wings. Female and autumn Bobolinks are best recognized by the yellowish tone of their general coloration, dark bar from eye, and light superciliary line, absence of white in the tail, and by their note, a short, sharp, metallic "*Klink.*"

Nesting. Nest of grass, on the ground in the grass.

Distribution. North and South America. In Canada, along the southern borders, in open places across the continent. In the west, the prairies and southern British Columbia.

The Bobolink in spring and summer is a bird frequenting hay and clover fields. It may be seen any summer's day perched on the surrounding fences or launching into the air on quivering wings, pouring forth its song of ecstasy. Later in the season the rollicking male doffs his parti-coloured gayness for the duller ochre and brown stripes of the female. His song is replaced by metallic klinks, and with hundreds of others of this species joined together in flocks he seeks the marshes until autumn. On leaving Canada for his winter home in South America he stops for a time in the rice fields of the Carolinas and here he is hailed not as Bobolink, the merry songster, beloved for both practical and sentimental reasons, but as the obnoxious "Ricebird" that settles upon the crops in thousands and causes decided damage. In the south before the Migratory Birds Convention Act was in force he was shot in great numbers and sold for food.

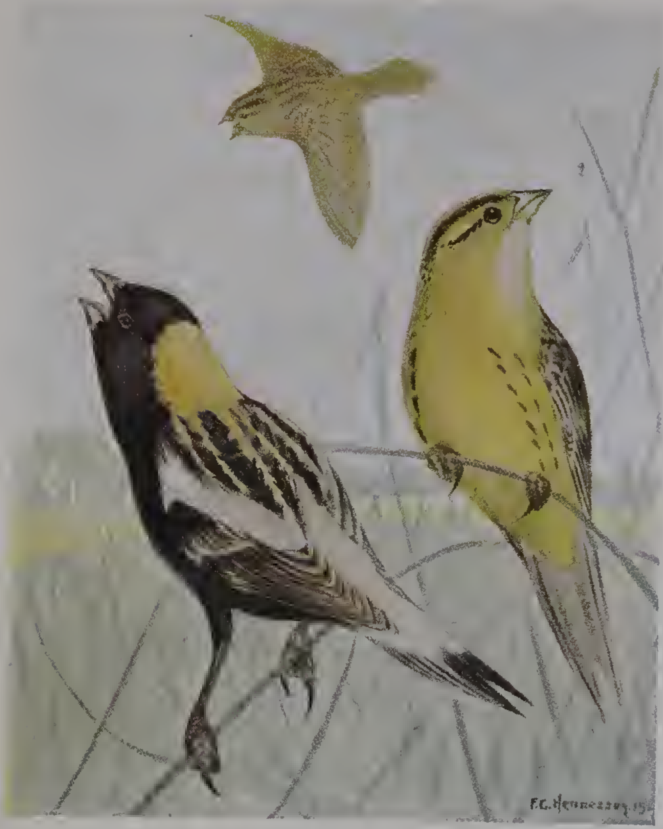
Economic Status. The Bobolink in Canada is an irreproachable bird who charms us with his song and whose bad habits have yet to be discovered. In May and June, 90 per cent of its food consists of injurious insects, and 10 per cent of weed seeds with a few useful insects. In July and August a very little grain is added. Yet this bird, owing to its devastation of the rice fields, is regarded as a pest in the southern States.

Flocks of from 25,000 to 30,000 have been reported on 60 acres of rice and the damage done a year is estimated at about one-quarter of the entire crop. This is a striking example of the economic status of a species changing with season, locality, and circumstance.

495. **Cowbird** (Including **Nevada Cowbird**). COW BLACKBIRD. BUFFALO-BIRD. *Molothrus ater.* L, 7·92. Plate XLVI B. The smallest of our Blackbirds. Male: solid black with seal-brown head and neck.

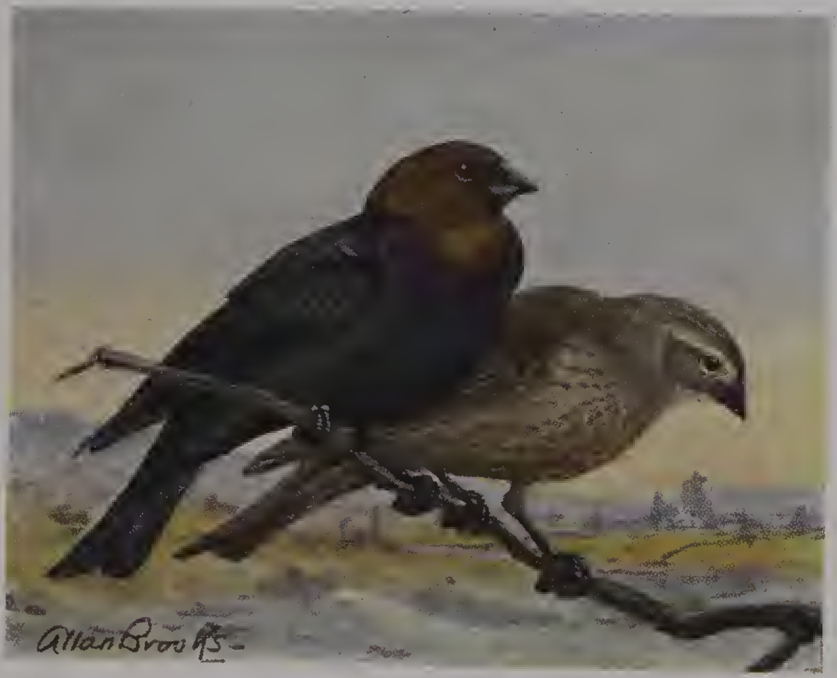
Distinctions. A small Blackbird, with short, sparrow-like bill (Figure 255). Male: jet black with metallic reflections and a seal-brown head. Female: uniform, ashy-brown, lighter on throat. Juveniles are similar to the female, but more light-buffy with many soft, broken, dark stripes below, and all feathers edged with buffy ochre.

Field Marks. A small Blackbird, with dark eyes and short bill; no decided markings anywhere. Notes, a harsh rattle and a grating squeak.



A. Bobolink; scale, $\frac{1}{3}$

Male Female



B. Cowbird; scale, $\frac{1}{3}$

Male Female

Nesting. Eggs laid in nests of other, usually smaller, birds. Entirely parasitic.

Distribution. North America, south to Mexico. In Canada, across the continent; in the west, southern British Columbia and from the Mackenzie southward.

SUBSPECIES. The subspecies recognized by the Check-list as inhabiting Canada is the type form, *Molothrus ater ater*. A western subspecies, the Nevada Cowbird *Molothrus ater artemisiae*, has been proposed. It is postulated to have a slightly more slender bill, but this feature is not very marked or very constant. Western females show a faint striping below that is less apparent in eastern specimens. This is the form to be expected from Manitoba, westward.

The Cowbird is our only habitually parasitic bird. It never builds a nest nor incubates nor cares for its young. In the absence of the rightful owners it takes the opportunity of depositing one of its own eggs in the unguarded nest of other birds. Usually the birds so imposed upon accept the foreign egg without protest, at other times there are strong objections and final resignation. In a few cases, the nest is deserted or a new nest is built over the offending egg, as is sometimes done by the Yellow Warbler. On incubation an interesting case of adaptation is shown. The Cowbird's egg usually hatches a few hours before those of the original occupant of the nest and consequently the interloper is strong and well grown when the proper occupants of the nest break their shell. It can monopolize the food, thus increasing the difference in strength, and is able finally to hoist its competitors from the nest to perish on the ground while it receives the attention that should have been given to the rightful brood. Thus practically every Cowbird is raised to maturity at the expense of a brood of another species and the Cowbird must be considered one of the greatest enemies of the species imposed upon. Once the foster-parents accept the intruding egg they do not make any distinction between it and their own. The Cowbird receives its name from its habit of following cattle, evidently attracted by the flies and insects which gather about those animals.

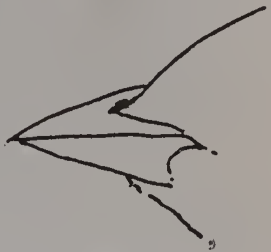


Figure 255
Bill of Cowbird; natural size.

In the early days, it probably followed the buffalo, which suggested its old, nearly forgotten name of Buffalo-bird.

Economic Status. From a study of their food, Cowbirds would seem to be purely useful birds. They consume large amounts of weed seeds and harmful insects and only small quantities of grain or fruit, the grain largely waste and the fruit wild. Their effect upon other equally useful birds, however, puts a different complexion on their activities. Practically every Cowbird raised to the fledgling stage means the elimination of a nest full of other species. Perhaps the economic effects of the changelings equal those of the individuals they displace, but the substitution cannot be looked upon with equanimity.

497. **Yellow-headed Blackbird.** *Xanthocephalus xanthocephalus.* L, 10·0. Plate XLVII A. Slightly larger than the Red-winged Blackbird, with a bright yellow hood over head, neck, and breast, and conspicuous white area at base of primaries on forepart of wings. Female: uniform dark brown with throat and upper breast dull white or dull yellow. Younger juvenile birds are like females, but with rusty-ochre hood.

Distinctions. The adult male is unmistakable. In females and young birds, the white wing marks are missing, but the whitish or dull yellow throat and the well-defined rusty-ochre hood are distinctive. This latter description may suggest the autumn Rusty Blackbird, but the rusty colour of that species blends away on the body and never resembles a hood.

Field Marks. The male, with its black body, yellow hood, and white wing-patches, is very conspicuous. The light, or dull yellow, throat and foreneck of the female and the dull ochre hood of the juvenile are almost as easily recognized.

Distribution. Western North America. In Canada, the Prairie Provinces, north to southern Mackenzie, and southern British Columbia. Scarce or absent west of the Coast range.

Nesting. Nest of grasses, etc., tied to reeds or tules over water.

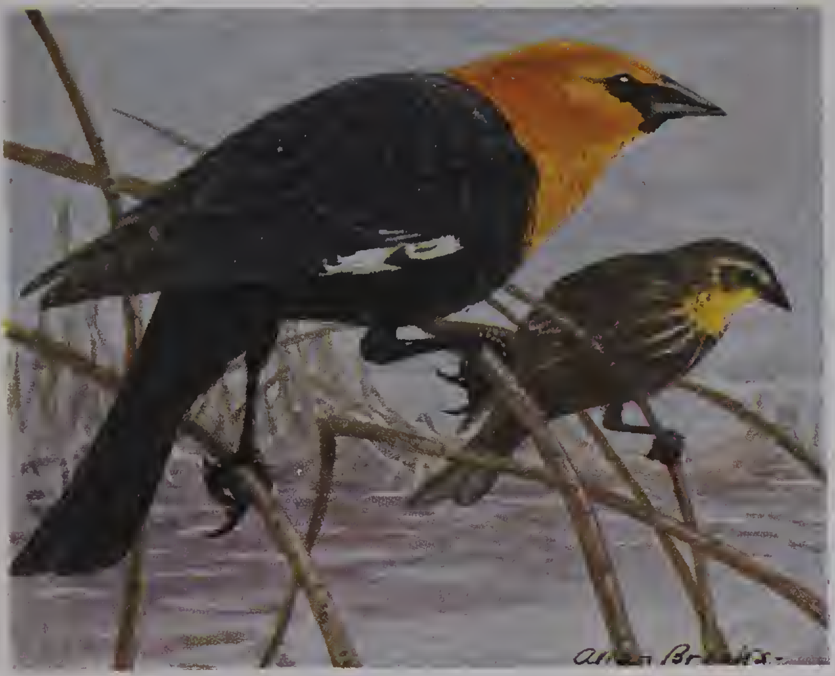
The Yellow-headed and Red-winged Blackbirds have much in common; they inhabit reedy or tule marshes and sloughs and both are clownish. The nesting marsh of a colony of Blackbirds is a noisy and busy place. There is continual going and coming, visiting, forays, and alarums; much fluttering of black wings, with incidental display of brilliant colour as yellow heads or red epaulettes flash in the sun; and a constant conversational croaking and gurgling of harsh, rough voices, with intermittent outbreak of strenuous raucous objection and expostulation. In these, both species take equal part.

The song of the Yellow-headed—if song it can be called, as it lacks every musical quality—is like that of no other Canadian bird. Climbing stiff-leggedly up a reed or tule stalk the male, with wings partly raised, lowers his head as if about to be violently ill, and disgorges a series of rough angular consonants, jerkily and irregularly, with many contortions and writhings as if their sharp corners caught in the throat and they were born with pain and travail. They finally culminate and bring satisfied relief in a long-drawn, descending buzz, like the slipping of an escapement in a clock spring and the consequent rapid unwinding and futile running down of the machinery. The general effect of the performance may be somewhat suggested by the syllables—"*Klick-kluck-klee- - -klo-klu-klel- - -kriz-kri-zzzzzzzzeeeeee.*

The Yellow-headed seem to require rather larger marsh areas than do the Red-winged, and, except locally, are not as numerous as that species. In the late summer and autumn, they join together in large flocks, sometimes mixed with other species of Blackbird, and lead lives of roving irresponsibility and good feeding. The days are spent on the bountiful stubble fields, and the nights in the marshes. A Blackbird roost just before sunset is an interesting place indeed. The birds come in from every direction, talking and croaking loudly, in vast black clouds, looking, on the horizon, like wisps of smoke blowing before the wind. They pitch into a bed of reeds already occupied by earlier arrivals, until each stalk seems strung with big, black beads. At the onslaught of the incoming contingent, birds are dislodged right and left, there is a babel of protesting voices and a fluttering of many wings that whirr loudly in the still air as the surface of the green marsh boils with black forms seeking new resting places. The confusion gradually subsides until the next arriving flock starts the hubbub over again. Thus it goes as the sun sinks, until all are in, and then the evening wind chases waves over the soft green surface of the reed beds, without revealing a hint of the hordes of black bodies beneath that are resting through the stillness of the night.

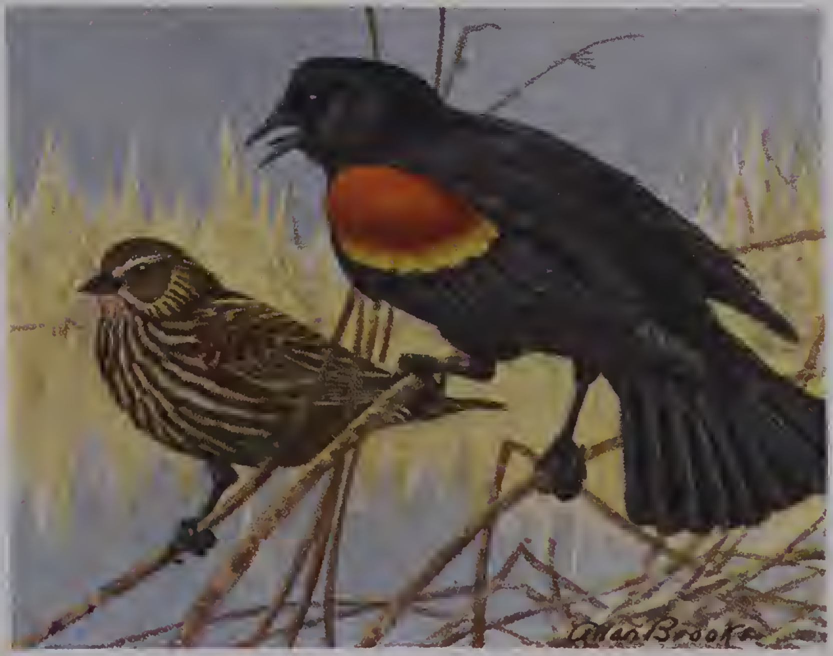
Economic Status. Though a bird of the marshes, the Yellow-headed Blackbird does not confine its attention to the immediate neighbourhood, but forages about corrals, barnyards, freshly ploughed ground, and similar places. It is a ground feeder, and insects harmful to vegetation constitute 30 per cent of its food. Grain, mostly oats, constitutes a fairly large proportion of its food, but as much of this grain is waste, little complaint can be lodged against this species.

PLATE XLVII



A. Yellow-headed Blackbird; scale, $\frac{1}{3}$

Male Female



B. Red-winged Blackbird; scale, $\frac{1}{3}$

Female Male

498. **Red-winged Blackbird** (Including **Thick-bill, San Diego,** and **Northwestern Red-wing**). SOLDIER BLACKBIRD. *Agelaius phoeniceus.* L, 9·51. Plate XLVII B. Male: black with brilliant red shoulders. Female: dark brown above, softly tinged and striped with rusty and dull ochre; below, striped with dull white and dark brown.

Distinctions. The spring male, with his jet black body and the brilliant crimson and yellow shoulder bars formed of the upperwing coverts, is unmistakable. The brown female, sharply striped below, is also easily recognizable. Young males have the black more or less feather edged with rusty and the red of the wings reduced to scattered spots of red or orange.

Field Marks. The black body and red shoulders of the male. The female's general Blackbird appearance and the sharp striping below. The Red-wing has many notes common to nearly all the Blackbirds, but the most distinctive one may be rendered a clear drawn-out "*O-ke-leeee*" or "*O-ke-reeee*" with a rising inflection at the end. It is a characteristic and not unmusical sound of the marshes and sloughs.

Nesting. In well-made structure of grasses tied to rushes or tules, above the water.

Distribution. North America, from central Mackenzie south. In western Canada, across the continent, in all suitable reedy or tule marshes of the Prairie Provinces and southern British Columbia.

SUBSPECIES. The Check-list recognizes a number of geographical races of this species. The Eastern Red-winged *Agelaius phoeniceus phoeniceus* occurs east of the Great Lakes. The Thick-billed Red-winged *Agelaius phoeniceus fortis* inhabits the Prairie Provinces. Some authorities divide this form into northern and southern races, referring Canadian birds to the Northern Red-winged *Agelaius phoeniceus arctolegus.* The bird of the interior valleys of southern British Columbia is referred to the San Diego Red-wing *Agelaius phoeniceus neutralis* and that of the coast is the Northwestern Red-wing *Agelaius phoeniceus caurinus.* The differences between these forms are so slight and variable as to be of little popular interest and only possible of recognition by the enthusiastic expert.

No reedy marsh in Canada is complete without one or more pairs of Red-wings chasing each other or clinging to the cat-tails or tules, the males spreading their wings and tail and twisting themselves into constrained attitudes as they squeeze out their clear "*O-ke-ree*" with a roll on the last syllable, in sight and hearing of the females. In the spring the Blackbirds usually arrive in large flocks of mixed species which keep together for a few days and then separate. The Red-wings repair to the marshes and before the reeds begin to grow they settle down to their domestic arrangements. When the family cares are over for the season all Blackbird species unite again in flocks that darken the sky, roosting together in the marshes when possible, and scattering during the day in groups of various sizes which frequent the harvest fields.

Economic Status. The character of its food makes the Red-wing decidedly beneficial. Weed seeds and injurious insects form 80 per cent of its food, and grain about 15 per cent. In July and August more grain is eaten, and in the early days of settlement when the acreage under cultivation was small and Blackbirds numerous, they were a serious menace to the crops.

501. 1. **Western Meadowlark.** *Sturnella neglecta.* L, 10·75. Plate XLVIII A. About the size of a large Robin, striped brown above, lemon yellow throat, breast and underparts with contrastive black necklace or gorget. Bill, long and pointed (*See* Figure 256).

Distinctions. Unmistakable for any other species, except the Eastern Meadowlark, which it resembles so closely in everything but voice, as to be separated from it only with difficulty. However, we have no hint of the Eastern Meadowlark occurring in Canada west of the Great Lakes.

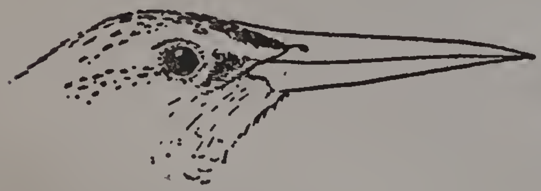


Figure 256
Meadowlark; scale, about ⅔.

Field Marks. Large size; brown back; yellow throat, breast, and underparts with black necklace; and the white outer tail feathers, shown in flight, makes the species easy of recognition. Its remarkably clear, musical, and varied song is very distinctive.

Nesting. Nest of grasses on the ground in the grass, usually arched over like an oven.

Distribution. Western North America. In Canada, the southern prairies and southern British Columbia.

Though beautiful as a bit of colour, the Western Meadowlark derives most of its well-earned fame from its voice, which rings rich, full, and true over the open fields and prairies. To the easterner hearing the Western Meadowlark for the first time, no matter how well prepared for it he may be, there comes a distinctly pleasant surprise. The bird itself is an exact replica of his old familiar friend of the eastern provinces in appearance and habit, but the voice bears no resemblance, except in occasional commonplace notes. It is not a glorified Eastern Meadowlark song, but one entirely different, and at first sound he can scarcely connect it with the familiar-looking bird on the nearby fence-post. To attempt to describe the song to those who know it would only be an interesting experiment at word painting. No words, syllables, or musical notes can assist the imagination of those who have not heard it. Its only quality that can be well expressed is its ventriloquistic effect. It sounds in the ear loud and close and one glances up at the near fence-line for it, only to finally discover it across the intervening field some hundred yards away.

After the long winter, when the Chinook winds have melted away the dreary white expanse of snow surrounding the prairie ranch house, the clear notes of the Meadowlark proclaim the first advent of spring. No bird is as well known or as much beloved by the western plainsman as is the Meadowlark.

Economic Status. The Meadowlark is one of the farmer's most valuable assistants. Living close to the ground it attacks most of the worst crop foes. Its food is made up of 75 per cent insects, 12 per cent weed seeds, and 13 per cent grain, the latter being nearly all taken in the late autumn and early spring months and obviously owing to the scarcity of insects. It is, therefore, as useful as it is pleasing to the eye and ear.

506. **Orchard Oriole.** *Icterus spurius.* L, 7·32. A small Oriole, like the Baltimore (*See* Plate XLVIII B) with the orange of that bird replaced by seal-brown and with a black tail. The female is an even, dull green. The young male is like the female, but has a black throat.

Distinctions. The seal-brown and black coloration of the male is unmistakable. The female has a certain resemblance to the female Tanager, but is smaller and of more delicate shape and has a fine-pointed, unnotched bill (Compare Figures 257 and 273, pages 269 and 301).

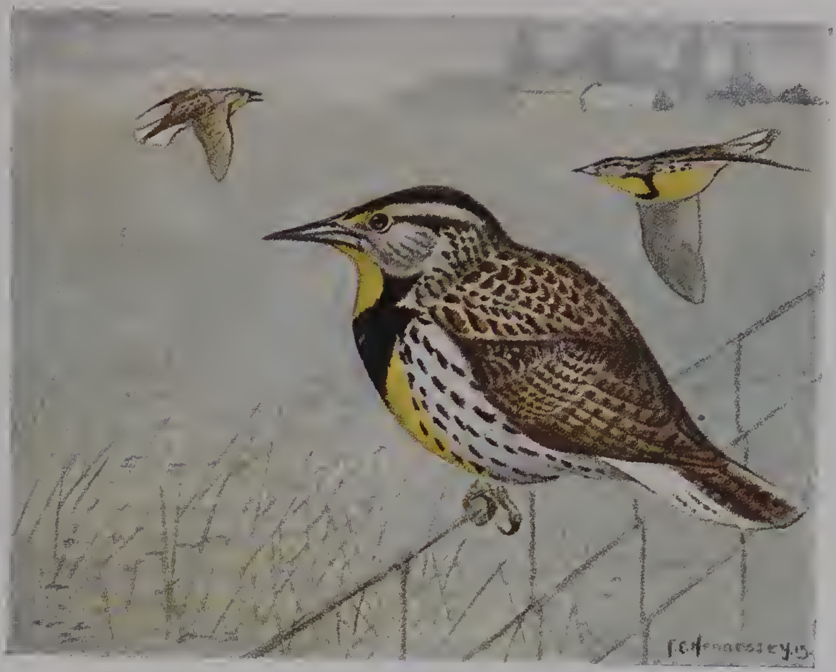
Field Marks. Colour, size, and voice somewhat like that of the Baltimore Oriole, but richer and with characteristics of its own.

Nesting. Nest woven of green grass hanging from a crotch. A beautiful structure, not as elaborate nor as deeply bagged as that of the Baltimore.

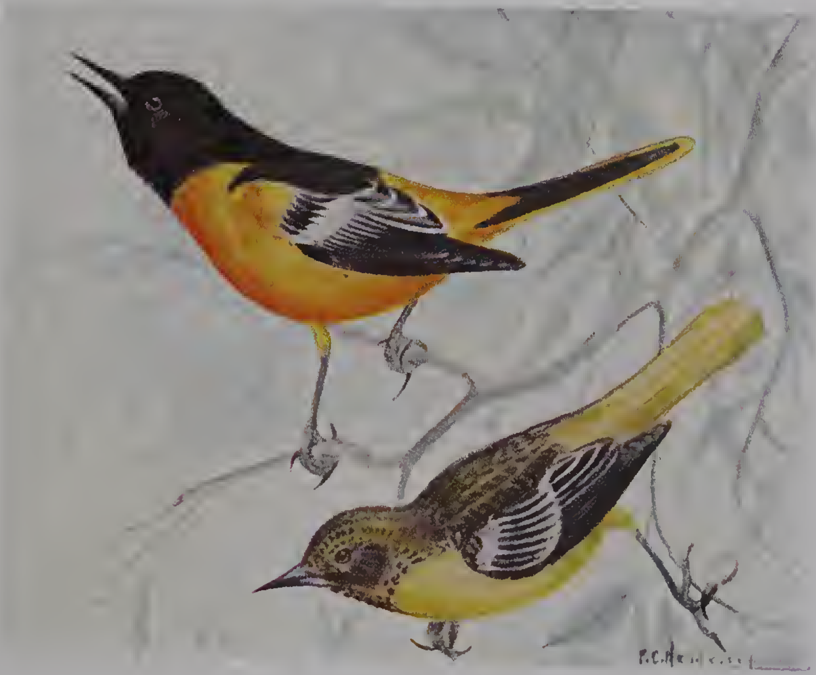
Distribution. Eastern North America, more southern than the Baltimore. It was taken at Pembina, in North Dakota, just across the Manitoba boundary, in 1879, and may be looked for as a straggler in the southern parts of that province.

507. **Baltimore Oriole.** HANG-NEST. GOLDEN ROBIN. *Icterus galbula.* L, 8·00. Plate XLVIII B. Between a Robin and Sparrow in size. Male: a rich golden orange with black head, back, wings, and most of tail. Female: dull orange below and smooth shades of brown and dull olive above.

Distinctions. Likely to be confused only with its nearby relative, Bullock's Oriole, with which it may be associated in southern Alberta and adjacent parts of Saskatchewan. The adult male is easily distinguished from that species in having an all-black head and little or no white on the wings. The female is too like the female of Bullock's to be readily separated from it, but, in general, is richer in coloration, usually more orange below, and with many dark centres to feathers of back, especially on crown. Juvenile males are much like females and various intermediate stages up to the adult spring plumage occur.


F.C.Hennessey.13.

A. Meadowlark; scale, $\frac{1}{4}$



B. Baltimore Oriole; scale, $\frac{1}{3}$
Male Female

Field Marks. Throughout the Prairie Provinces, except in southern Alberta and adjacent Saskatchewan, this is the only Oriole to be regularly expected. The bright flashing orange and black livery of the male is easily recognized. In above localities the all-black face is distinctive from Bullock's Oriole. The female, larger than any other bird of similar coloration except Bullock's Oriole and the Tanagers, in its dull orange and green, is easily recognizable. It may not always be separable in life from the former except by geographical probability, but is easily distinguished from the latter by its general orange tone instead of plain dull green. The voices of the Orioles are always distinctive; a rich contralto whistle with numerous musical themes.

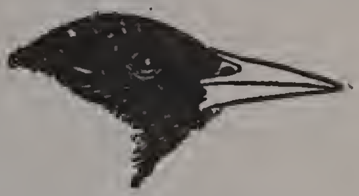


Figure 257
Baltimore Oriole; scale, about ⅔.

Nesting. The nest of the Baltimore Oriole is one of the avian curiosities. It is in the form of a bag woven of fibres, plant down, hairs, and string, and hangs from the end of long, drooping branches. With her sharp, awl-like bill the female thrusts a fibre into the side of the nest, then reaching over to the inside pulls it through, tugging to make all tight and solid, another fibre is thrust in and the process repeated until when complete the nest is so knitted, woven, and felted together that though tossed at the end of long, flexible, whip-like branch tips through summer and winter storms, it remains intact for several years.

Distribution Eastern North America. In Canada, west to the mountains and north to the central parts of the Prairie Provinces.

Open country with scattered groves and occasional large isolated elms is the ideal habitat of the Baltimore Oriole. It obtains its name from its brilliant orange and black livery, the colours of Lord Baltimore, under whose patronage the state of Maryland was first settled and in whose honour the bird was named by the early settlers.

Economic Status. The food of the Oriole consists mostly of insects, including, in order of numbers, caterpillars, click-beetles, of which the pestilent wire worms are the larvæ, May beetles, and grasshoppers. Very few predaceous beetles are taken. The amount of vegetable matter is small. This species, therefore, ranks very high as an insect destroyer. Complaints are sometimes made that the Oriole spoils fruit, and it has been accused of puncturing grapes for the juice. Though the Baltimore Oriole cannot be altogether exonerated from these charges, they are very easily exaggerated, and are of little import in the Prairie Provinces. The good the bird can do is great, and the harm occasional and slight, except under local and particular conditions.

508. **Bullock's Oriole.** *Icterus bullocki.* L, 8·25. Plate XLIX A. Between a Robin and a Sparrow in size, averaging a little larger than the Baltimore Oriole. Male: a rich golden orange with elongated black bib, crown, line through eye, back, wings, and most of tail. Female: dull orange, or warm yellowish to white below, and smooth dull olive above.

Distinctions. Most likely to be confused with its near relative, the Baltimore Oriole, with which it may be associated in southern Alberta and adjoining parts of Saskatchewan. The adult male is easily distinguished from that species by its golden face and superciliary line; and conspicuous amount of white on the wing, the greater and adjoining coverts being mostly white, instead of white only on the tips of the greater. The female is too like the female of the Baltimore to be readily separated from it, but, in general, is paler, with few, if any, dark feather centres on the back, and the crown usually uniform yellow or golden olive. Juvenile males are like the female, and various intermediate stages up to the adult spring plumage occur.

Field Marks. Throughout southern British Columbia this is the only Oriole to be expected. In southern Alberta and adjacent Saskatchewan, either this or the Baltimore may occur. The black and orange plumage of the Orioles is easily recognized. From the Baltimore, Bullock's Oriole is distinguished by its golden face and superciliary stripe separated by a black line. The female in its dull yellow or orange and olive is larger than any other bird of similar coloration, except the Baltimore Oriole and the Western Tanager.

It may not always be separable in life from the former except by geographical probability, but is best distinguished from the latter by its general warm orange or yellow tone instead of cold, dull green. The voices of the Orioles are always distinctive, a rich contralto whistle with numerous musical themes, but the voice of Bullock's Oriole is not so fine nor so full as that of the Baltimore.

Nesting. A deep bag of woven fibres, plant down, hairs, and string hanging from the tips of long branches. Similar to that of the Baltimore Oriole.

Distribution. Western North America. In Canada, southern British Columbia, chiefly east of the Coast range, and extreme southern Alberta and adjoining Saskatchewan.

Very similar in habits and general status to the Baltimore Oriole, but rather less musically pleasing and less conspicuous than that species.

Economic Status. Food analysis of stomach contents in fruit districts shows that about 79 per cent of the food of Bullock's Oriole is animal matter and 21 vegetable. Lepidoptera, in the form of moths, pupæ, and caterpillars, are the largest item, but scales are a standard item of diet. Beetles, almost all harmful species, bulk largely in the food supply. Nine per cent of the vegetable food is fruit, largely cultivated varieties where they can be obtained. With its good record as a fruit-pest destroyer, only the prejudiced or particularly unfortunate sufferer will fail to admit that it is most beneficial.

509. **Rusty Blackbird.** RUSTY GRACKLE. *Euphagus carolinus.* L, 9·55. Very like Brewer's Blackbird (*See* Plate XLIX B). About the size of the Red-winged and Brewer's Blackbird. All black or all black washed with rusty. Much larger than the Cowbird, but considerably smaller than the Bronzed Grackle. Eyes, straw-coloured in both sexes.

Distinctions. With size and plain black coloration, easily confused with Brewer's Blackbird, but the spring male has green instead of purple reflections on the head. In autumn, the Rusty Blackbird is strongly overwashed with ruddy rusty above, solid and complete on crown; and rusty ochre below, strongest on superciliary line and throat. Females are solid smoky black, slightly darker than the female Brewer's, and usually with faint traces of rusty on breast or back. The throat never lightens to ashy. On the average, the bill is slightly longer and more slender. Some specimens are very difficult to separate.

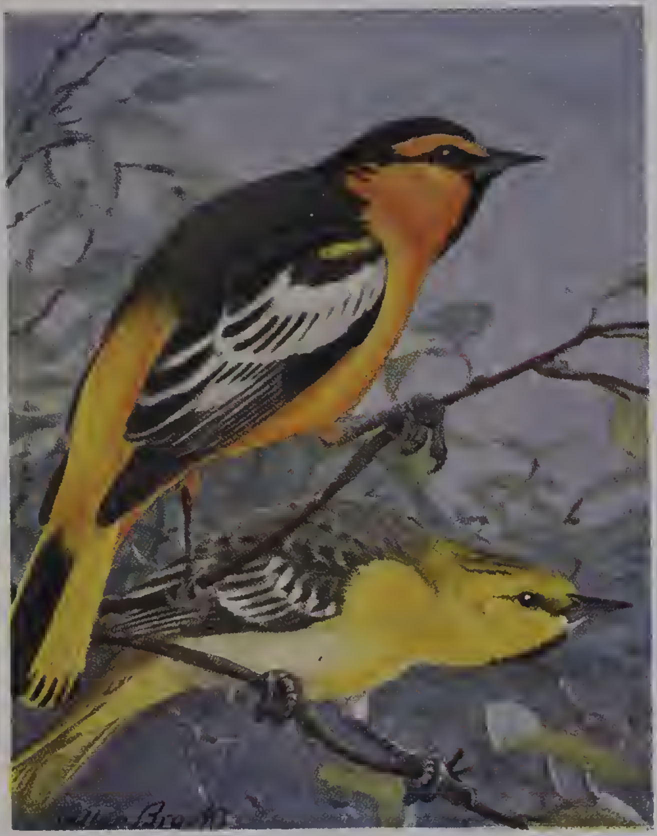
Field Marks. Medium size, and solid black coloration, or black with much rusty overwash and decided ochreish superciliary line. Eyes in both sexes pale straw-yellow. Male recognized from Brewer's by green instead of purple reflections about head; the female by having pale, straw-coloured eyes.

Nesting. A bulky structure in coniferous trees or on the ground.

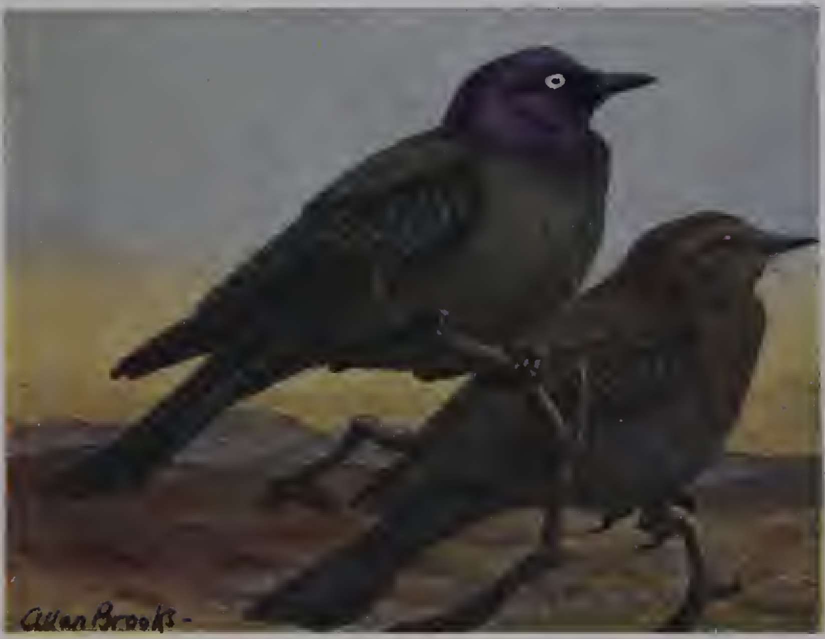
Distribution. Eastern and northern North America. In Canada, across the continent, west to the mountains, breeding from northern tree limit to the edges of the prairies. Occasional in southern British Columbia in migration, where it seems to be increasing of late years. This is only a migrant throughout most of the breeding range of Brewer's Blackbird.

The Rusty Blackbird comes in great numbers in spring and autumn, joining and forming a considerable part of the large flocks of mixed Blackbirds that are seen about the fields and marshes. The name Grackle which is commonly applied to the two yellow (nearly white)-eyed Blackbirds is doubtlessly derived from the sound of their harsh, crackling notes.

Economic Status. Though the Rusty Blackbird is fairly omnivorous, it shows a decided preference for animal, over vegetable, food. The animal matter amounts to 53 per cent, very little of which is of sources beneficial to man. Grain constitutes a remarkably small percentage of the whole. As the bird is mostly a migrant through cultivated sections, coming in numbers only after the harvest, and haunting stubble principally, most of the grain taken is necessarily waste.



A. Bullock's Oriole; scale, $\frac{1}{3}$
Male Female



B. Brewer's Blackbird; scale, $\frac{1}{3}$
Male Female

510. **Brewer's Blackbird.** *Euphagus cyanocephalus.* L, 10. Plate XLIX B. About the size of the Red-winged and Rusty Blackbirds. All black. Much larger than the Cowbird, considerably smaller than the Bronzed Grackle. Eyes, straw-coloured in male, brown in female.

Distinctions. With size and plain black coloration, easily confused with the Rusty Blackbird. The male has purple, instead of green, reflections on the head. In autumn there are very slight feather edgings of ashy on head, breast, and back, but never any distinct rusty. Females and juveniles are solidly smoky black, a little lighter than the female Rusty Blackbird with slightly more of a brown, instead of a grey, tone, to underlying body colour, and usually lightening to ashy on throat and face. In the average, the bill is slightly shorter and heavier. Some specimens are difficult to separate from that species, and on the whole the ashy tone of the breast, throat, and face is the best guide to separation.

Field Marks. Medium size and solid black coloration, never with rusty overwash or strong ochreish superciliary line. Eyes of male pale straw-yellow. Male separated from the Rusty Blackbird by purple instead of greenish reflections on head, and female by having brown instead of light straw-coloured eyes.

Nesting. A bulky structure of grasses, etc., in trees, stumps, low bushes, or on the ground.

Distribution. Western North America. In Canada, from Manitoba west to the coast, north, to central British Columbia, and the heavy forests of the Prairie Provinces.

Brewer's Blackbird is one of the commonest birds of the west. It is not so restricted to the marshes as the Red-winged or Yellow-headed Blackbirds, but scatters all over the country wherever a little brushy scrub occurs, preferably, but not necessarily, near water. It frequents the barnyard and often nests in the immediate vicinity of habitations. It is slightly gregarious in nesting and small colonies are common. It associates with Cowbirds about sheep and cattle and may often be seen perched on their backs seeking the parasites.

Economic Status. Although Blackbirds flying in flocks that darken the air have always been looked upon with suspicion, few complaints have been laid against this particular species. An analysis of its food shows that 32 per cent is animal and 68 vegetable. Of the animal portion, a large amount consists of grasshoppers, caterpillars, and insect pupæ, mostly of ground-inhabiting forms. Of the vegetable food, grain is largely represented, but is greatest in the winter months when obviously waste. Though it takes some fruit, it has been known to desert cherries for newly ploughed fields nearby, and is evidently not a pronounced fruit destroyer. On the whole, it seems to be a most valuable bird.

511. **Crow Blackbird.** BRONZED GRACKLE. *Quiscalus quiscula.* L, 12. Plate L A. The largest of the Blackbirds.

Distinctions. Large size, complete iridescent blackness, and straw-coloured eyes.

Field Marks. The all-black body, straw-yellow eyes, and size are good field marks. When flying the long tail of the male is "boated", that is, spread and turned up at the sides so that a cross-section through it would be U-shaped. This is a most characteristic feature and easily seen in outline against the sky in spring, but is less evident or absent in autumn.

Nesting. Usually in communities in coniferous trees; nest, a large, bulky mass of grass and mud. Some in hollow trees.

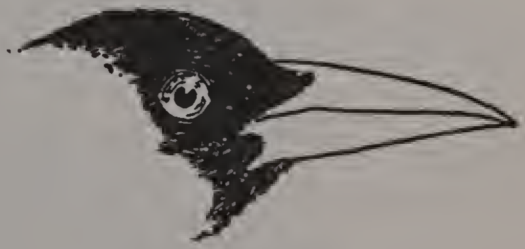


Figure 258

Bronzed Grackle; scale, about ⅔.

Bill left white to show shape.

Distribution. Temperate North America, east of the Rockies. In western Canada common in southern Manitoba, growing scarcer and local west towards the mountains in the southern parts of the Prairie Provinces.

SUBSPECIES. The Canadian representative of this species is the Bronzed Grackle, *Quiscalus quiscula aeneus.*

The Crow Blackbird is a gregarious bird and likes to nest in company with its own kind. Evergreens are its favourite nesting trees and it often takes possession of ornamental rows, edging gardens. Its metallic colours and yellow eyes make it a brilliant and striking bird. It walks with comical pomposity over the lawn, or uncouthly gesticulates while it voices unusually discordant noises.

Economic Status. Through the months the bird is in Canada, insects constitute 29·7 per cent of its food and vegetable matter 70·3 per cent. The insects include useful predaceous species, but not in large numbers. The vegetable matter contains about 48 per cent of grain and domestic fruit, the remainder being wild fruit, mast, and weed seeds. Much of the grain is waste, and the total cultivated fruit is only 2·9 per cent. On the whole the work of the Bronzed Grackle is beneficial, but its numbers should not be allowed to increase greatly. It is an inveterate nest robber, and a poor bird to have about the house if other more attractive species are desired.

FAMILY—FRINGILLIDAE. SPARROWS, LINNETS, FINCHES, OR BUNTINGS

General Description. As represented in Canada this is generally an easily recognized family. It is composed of small birds—no Canadian species being over 8½ inches in length—with unnotched conical bill adapted for cracking seeds, and the gape of the mouth usually decidedly turned down (Figures 259, 260, 261). This latter feature is not equally well developed in all species and some of the American Starlings, as previously described (page 263), exhibit it strongly; but, having other marked characters, they can be easily distinguished from the Sparrows.

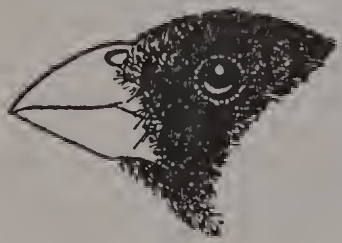


Figure 259

Bill of Rose-breasted Grosbeak; about natural size.

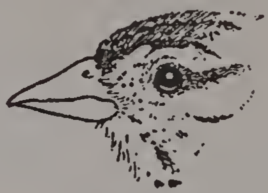


Figure 260

Bill of Song Sparrow; about natural size.

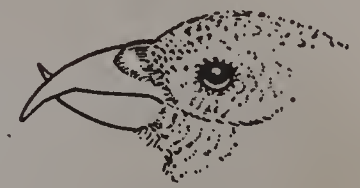


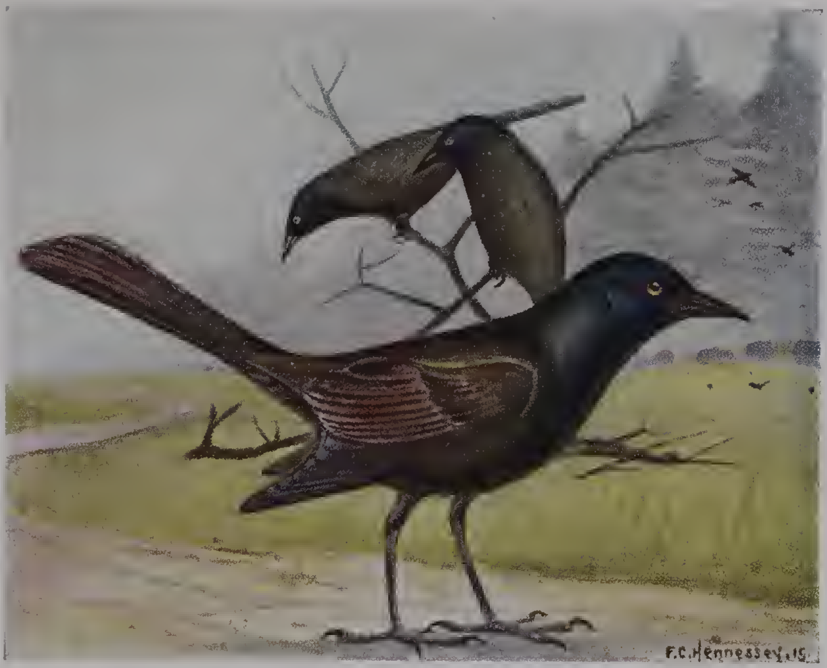
Figure 261

Bill of Crossbill; about natural size.

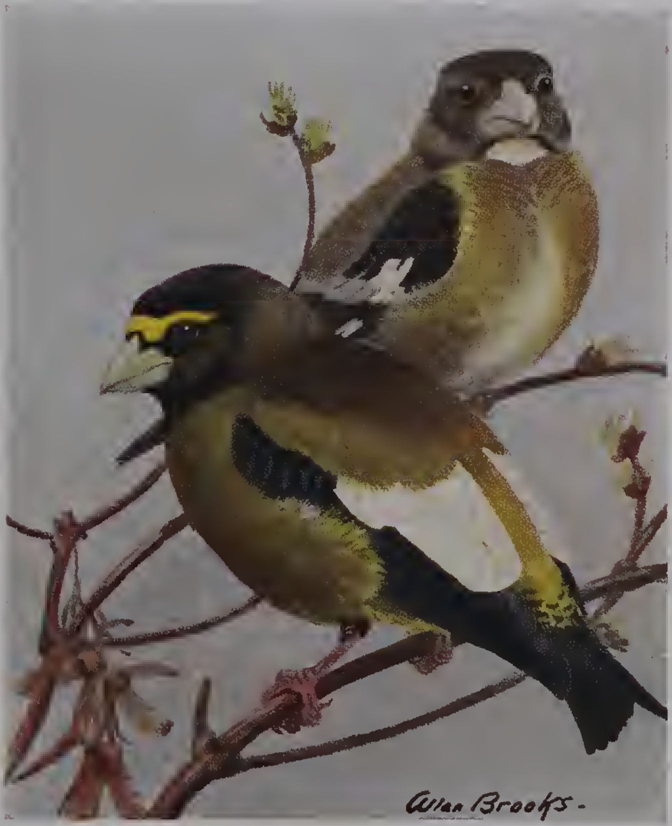
Distinctions. The bill is the best point of recognition; that of the ordinary domesticated Canary is of the characteristic Sparrow type. The birds most likely to be mistaken for members of this family are the Bobolink (Figure 254, page 264) and Cowbird (255) of the previous family, and the Tanagers of the next one. These are all easily separated by their striking colours (*See* under specific headings). The Tanagers show notches in the cutting edges and tip of the mandibles which make them easy to recognize (Figure 273, page 301). In one group of Sparrows, the Crossbills, the tips of the bill cross each other (Figure 261); in another, the Grosbeaks, the bill is very large and heavy (Figure 259).

The Sparrows form the largest and most important family of the Perchers, and are probably the most important family of birds in the world. They are found everywhere except in Australia and are represented in all habitats from wet swamps, grassy uplands, and brushy thickets, to dry plains and sand-dunes. The terms Sparrow, Linnet, Finch, and Bunting are almost synonymous and are applied to various species irrespective of their relationship. The name Sparrow is, there-

Plate L


F.C.Hennessey.15.

A. Bronzed Grackle; scale, $\frac{1}{4}$


Allan Brooks.

B. Evening Grosbeak; scale, $\frac{1}{3}$

Female

Male

fore, a very broad one and may be applied to many species. It is a pity that one objectionable introduced form should, in America, have cast discredit upon a large family which includes many beautiful as well as useful birds and some of great sweetness of song. The most typical feature of the Sparrows in popular estimation is a plain earthy coloration, but some of the brightest of plumages are found amongst them and in place of the commonly expected Sparrow chirp are some remarkable vocal achievements. The Sparrows may be divided roughly into ground species, tree species, winter wanderers, and Grosbeaks. Superficially observed, the first are dull in appearance, but, on close examination, often show beautiful colour harmonies. The tree species are often very brightly coloured. The winter wanderers usually exhibit a large amount of dull reds. The Grosbeaks, recognized by their great, heavy bills (Figure 259), are highly coloured. This is not a scientific subdivision, but as the recognition of Sparrows is difficult to the amateur any classification that will help is of use.

514. **Evening Grosbeak** (Including **Western** and **Columbian Evening Grosbeaks**). *Hesperiphona vespertina.* L, 8. Plate L B. One of the largest of the Sparrows, with a very large, powerful, typical Grosbeak bill (like Figure 259). It is coloured in broad masses of strong lemon yellow, with black wings, tail, and crown; secondaries and tertiaries largely white; a bright yellow bar on forehead. The female is similar, but much duller and with an ashy wash over all.

Distinctions. Size; large yellowish or pale greenish bill; large amount of yellow and contrastive black and white wings. The male is unmistakable. The female, with her light-coloured bill, lemon yellow on body, and large patch of white on black wings, is quite different from any other Grosbeak (*See* Plates LI A, LX A, and LX B).

Field Marks. Males are unmistakable. Large size, short tail, yellow coloration, pale coloured bill, and large white patch in black wings. As it is usually a winter visitor within settled sections, females are most often to be compared with female Pine Grosbeaks, (Plate LI A), another winter migrant, but they are not so dull or evenly coloured and have pale beaks and contrastive black and white wings. The females of the Rose-breasted and Black-headed Grosbeaks are both sharply streaked (Plate LX A and B).

Nesting. In trees; nest of small twigs, lined with bark, hair, and rootlets. Nests have been found only in the western mountain districts, and have usually been in the tops of tall trees and difficult to locate.

Distribution. Central and western North America. Breeding in the northern coniferous forest from western Ontario westward, and along the mountains to New Mexico. Migrates south and east in winter.

SUBSPECIES. The species is divided into two races in the Check-list; the Eastern Evening Grosbeak *Hesperiphona vespertina vespertina* occupies the mid-section of the continent. The Western Evening Grosbeak *Hesperiphona vespertina montana* inhabits the mountains of the west. Later, and perhaps better advised, authorities refer the northern birds of the western race to the Columbian Evening Grosbeak *Hesperiphona vespertina brooksi*, distinguished from the eastern one by the bill averaging slightly slenderer and with more and darker olive in the yellow of the male. The female has a darker crown in slight contrast with the back. This last detail seems the most constant distinction. This is only a winter visitor to most of the prairie country, and an irregular wanderer in the east. It is very irregular in its summer and breeding range, being present one year and absent the next. In summer it is very retiring and unobtrusive, frequenting the tallest trees where it is very difficult to observe. It is only recently that we have succeeded in getting any authentic data north of lake Superior on the breeding range of the eastern race, though that of the western one has long been known.

Economic Status. The Evening Grosbeak, coming only in winter, can do very little harm. Its favourite food is the seed of the Manitoba maple left hanging on the trees, or the fruit of the mountain-ash or rowan-trees. The fact that the Manitoba maple has in recent years been planted extensively in many parts of Canada may affect the migration habits of this bird. Almost any dried winter fruit is taken and it delights to remove the seeds from old rotten apples left hanging through the winter. The charge that it damages trees by picking off the buds may contain an element of truth, but the habit cannot be seriously considered as a source of appreciable damage.

515. **Pine Grosbeak** (Including **Rocky Mountain, Alaska, Kadiak,** and **Queen Charlotte Pine Grosbeaks**). *Pinicola enucleator.* L, 9·08. Plate LI A. One of the largest of the Sparrows, with typical, heavy grosbeak bill (like Figure 259). Dull, uniform grey, but the adult male suffused with strong rosy or scarlet hues over head, back, wings, and breast. Females and juveniles with rusty yellow suffusion over head and rump.

Distinctions. The red male is rather similar to the Purple Finch, but is a rosier red and much larger. By reason of winter occurrence in most localities, likely to be confused only with the Evening Grosbeak. The Pine Grosbeak, however, has a dark instead of a light coloured bill, and the wings are dull brownish grey with white wings-bars, but not conspicuously black and white. Unlike the female Rose-breasted or Black-headed Grosbeaks, it has no stripes anywhere in any plumage.

Field Marks. Size; dark, grosbeak bill, and the general red of adult male. The majority of birds that come south during migration are in the dull juvenile or female plumage, and a flock gives the effect of a number of large, dull, slate-coloured birds, in favourable lights warming to yellow on crown and rump. They are usually accompanied by a few rosy-red individuals. The ordinary notes are ridiculously small and thin for so large a bird, though it has a clear, loud whistle.

Nesting. In coniferous trees; nest of twigs and rootlets.

Distribution. Northern parts of Europe, Asia, and North America. In America, the northern parts of the continent and down the mountains to New Mexico. In Canada, breeding in the northern coniferous forest and south along the western mountains. Migrates southward in winter.

SUBSPECIES. Divided, by slight characters, into a number of geographical races. Those accepted in the Check-list for western Canada are as follows: the Canadian Pine Grosbeak *Pinicola enucleator leucura* is the eastern bird, breeding throughout the northern forest, west to the Mackenzie. The Rocky Mountain Pine Grosbeak *Pinicola enucleator montana* of the boreal summits of the mountains from central Alberta southward. The Alaska Pine Grosbeak *Pinicola enucleator alascensis* breeds from the Mackenzie into Alaska and down the mountains to the state of Washington. The Kadiak Pine Grosbeak *Pinicola enucleator flammula* breeds on the southern Alaskan coast. All these forms may occur south of their breeding range in winter migration. As the characters are difficult of recognition, the wanderings of the race have not been accurately mapped. A rich rosy form from the Queen Charlotte islands, *Pinicola enucleator carlottae,* the best-marked form of all, has recently been described, but has not yet been accepted by the Committee on Nomenclature.

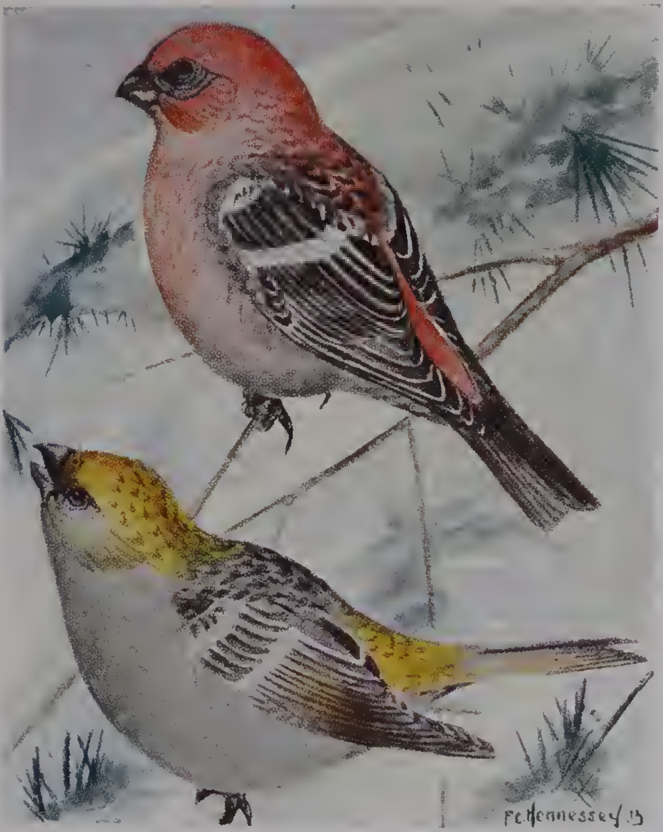
These, throughout most of southern Canada, are winter visitors from the north. Their presence can rarely be anticipated, for their movements are very irregular. They are frequenters of coniferous trees, but are very fond of the mountain-ash or rowan-tree berries and the fruit of the sumach.

Economic Status. As the Pine Grosbeak spends the summer in the northern woods and visits settled sections only in winter, the damage it can do is reduced to a minimum. It eats wild and waste fruit left hanging on the trees so that its economic effect is too slight to be appreciable.

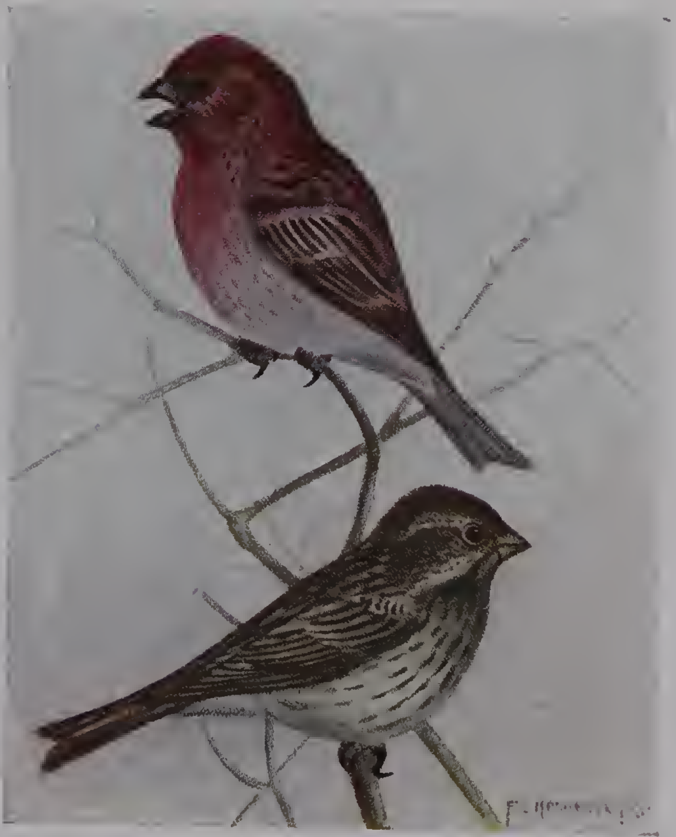
517. **Purple Finch** (Including **Californian Purple Finch**). *Carpodacus purpureus.* L, 6·22. Plate LI B. About the size of House Sparrow. Adult male: head, breast, back, and rump washed with dull purplish rose, more or less variegated or striped with brown on back. Wings and tail brown, slightly edged with rose. Below, white. Females and juveniles: dull brownish olive, more or less broken into stripes above, and heavily striped with olive on white below.

Distinctions. To be seriously confused only with Cassin's Finch of the interior of British Columbia. The adult male is red like the Pine Grosbeak, but very much smaller; the female and juveniles, with their considerable olive streaking, are quite distinctive from that species. The Purple Finch may bear a superficial resemblance to the Crossbills, but is larger and the mandibles are not crossed (compare with Figure 261). From

PLATE LI



A. Pine Grosbeak; scale, $\frac{1}{3}$
Male
Female



B. Purple Finch; scale, $\frac{1}{3}$
Male
Female

Cassin's Finch, the Purple can be distinguished only by attention to small details. The crown of the adult male is solid rosy, but not as bright as in Cassin's and it blends into the nape without forming a definite cap. In other plumages, the olive is of a slightly darker shade, and the streakings below are softer. The undertail coverts are generally unstreaked, or at least never so sharply, and the bird is appreciably smaller. A bird, though within the normal range of Cassin's Finch, with a wing of 3·3 inches or under, is probably this species.

Field Marks. Size, general colour of adult male, like a small Pine Grosbeak. General olive and white striping below of female and juvenile. Probably not separable with certainty from Cassin's Finch in life. That species, however, may be expected in Canada only in southern British Columbia east of the Coast range, where the Purple Finch does not regularly occur.

Nesting. In coniferous trees; nest of twigs, grass, and rootlets.

Distribution. Most of North America. In Canada, most of the wooded area, except British Columbia, east of the Coast range. Migrates south through the prairies.

SUBSPECIES. The form occurring throughout most of Canada is the Eastern Purple Finch *Carpodacus purpureus purpureus.* On the west coast of southern British Columbia occurs the California Purple Finch *Carpodacus purpureus californicus.* Its chief distinctions from the eastern race are: slightly smaller average size, more even coloration, and less striping in the red male, and a greener olive in the female.

The Purple Finch, so called, is not "purple" in the ordinary use of the term. "Magenta" would better describe it in modern terminology, but it has lately been said that the colour is really "purple" in the original application of the word. It is one of our finest songsters and is occasionally caged for that purpose. Like its allies, the Pine Grosbeak and the Crossbills, when kept in captivity it loses the bright redness of its plumage and assumes a ruddy yellow, so peculiar and characteristic that escaped caged birds can be recognized at sight. The song is a continued and clear warble like that of a Warbling Vireo, but more rapidly delivered. The young male in the autumn sings almost as well as the adult.

Economic Status. The Purple Finch eats largely of buds and fruit. The fruit eaten is generally trifling, as the bird retires from the borders to less cultivated sections in the breeding season and is not numerous in summer in fruit-growing sections. The fruits it takes are, therefore, mostly waste winter left-overs or wild forms, and it is specially fond of mountain-ash or rowan-berries. The charge that it eats buds is more serious, but so far has been based upon general assertions not substantiated by results of stomach examinations.

518. **Cassin's Finch.** CASSIN'S PURPLE FINCH. *Carpodacus cassini.* L, 6·75. Almost exactly similar to the Purple Finch (Plate LI B).

Distinctions. To be seriously confused only with the Purple Finch, and then only in the southern interior of British Columbia. Distinguished from that species by small details: the crown of the red male is a brighter, more crimson, red and forms a definite cap, and the body is pinker. In other plumages, the olive is of a slightly greyer shade, more of an earth brown, and the streakings below are sharper and better defined. The undertail coverts are always sharply centre-streaked, and the bird is appreciably larger than the Purple Finch. A Purple Finch with wing over 3·3 is probably this species. Otherwise, the male has a general resemblance to the Pine Grosbeak, but is considerably smaller, and various plumages may suggest those of the Crossbills although the mandibles are not crossed (Compare Figure 261), and the bird is slightly larger.

Field Marks. Size, general colour of adult, like a small Pine Grosbeak. General olive and white streakiness of the female and juvenile. Probably not separable from the Purple Finch in life, except on geographical considerations.

Nesting. In coniferous trees; nest of twigs, grass, and rootlets.

Distribution. Western North America. In Canada, regularly found only in the southern interior of British Columbia, east of the Coast range. It thus fills the gap between the Eastern Purple Finch of the prairies and the California Purple Finch of the coast; a distinct but closely allied species interposed between the ranges of two allied subspecies.

General habits and economic status not differing greatly from those of the Purple Finch.

House Sparrow. ENGLISH SPARROW. *Passer domesticus.* L, 6·50. Plate LII A. Male: striped with chestnut and black on back; crown and broad bar from eye to shoulders, slate; cheeks and below, white, with extensive black throat and breast patch. Female: general dull olive or dirty white below; back streaked with olive and brown; a white wing-bar.

Distinctions. Black bib of the male is distinctive. Females have an olive suggestion and might be confused with the female Purple Finch were it not that they are unstreaked below. The female or autumn plumages of the Bobolink are somewhat suggestive of this plumage, but the pronounced streakiness above and the general yellowness are quite distinctive of the Bobolink. With a little observation of the species in our streets or barnyards, no one need confuse this species with anything else.

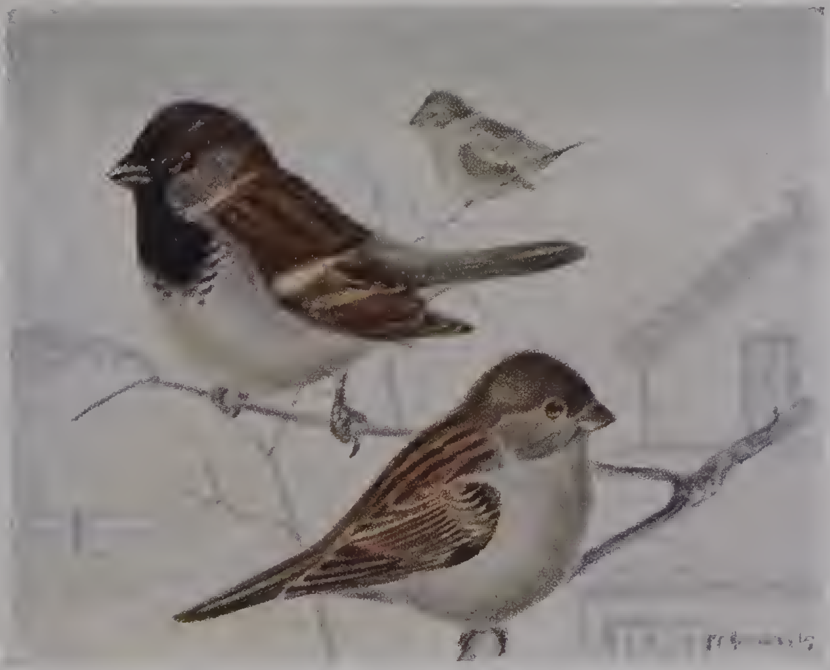
Field Marks. The characteristic notes and chirrups of the House Sparrow make the best recognition mark in the field. The male carries a conspicuous black bib and throat and prominent white wing-bars.

Distribution. Originally distributed over all Europe and most of Asia. Now found throughout North America to the limits of settlements and in places beyond.

This bird is not native to America, but is one of our most undesirable importations from Europe. In spite of its obvious seed-eating habits and structure, it was originally introduced as a caterpillar destroyer. It does, of course, like nearly all birds, sometimes eat caterpillars, but does not approximate in this direction the capacity of the birds it has displaced. Being a bird of cities and barnyards most of its activities are in localities where there is plenty of food of non-insectivorous character, garbage, waste grain, etc. In the autumn, it makes excursions into the country and visits fields in large flocks, mostly after harvest when waste grain is abundant, but occasionally before, and then causes considerable loss. Its food habits thus are harmful or not according to circumstances, and perhaps the balance lies well in its favour. The principal other objection to the House Sparrow are two in number. It drives more useful species away and it is very dirty about buildings.

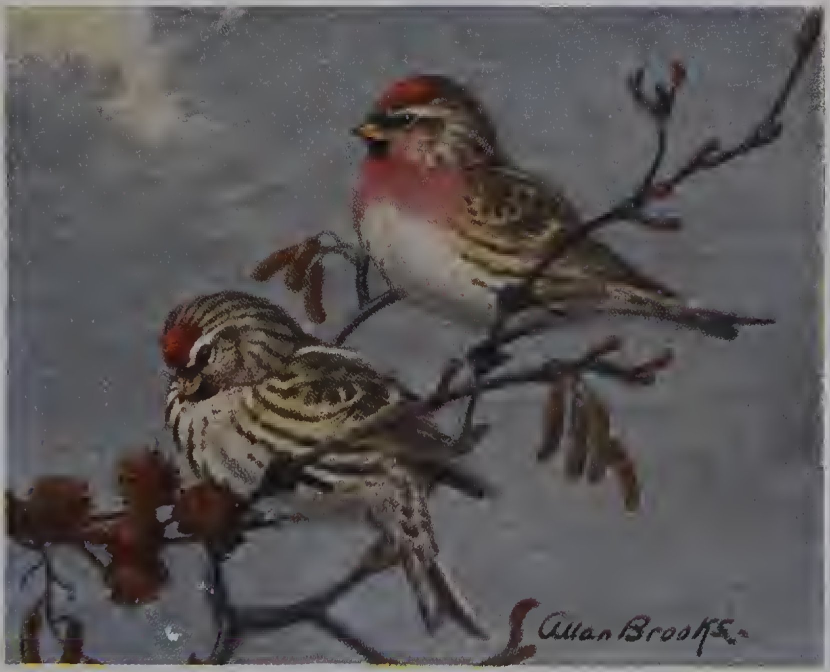
The House Sparrow drives other birds away by three methods: monopolizing the food supply; occupying their nesting places; and by pugnacious and bulldozing habits. During the nesting season while the young are being fed they come into direct competition with other species depending for the support of their young on the same insect forms (the young of all Passerine birds require insects, though those of this species are not long dependent upon them). Thus far perhaps they may be nearly as useful as the forms they displace, but most of the displaced birds are continuous insect hunters and the House Sparrow only a seasonal one. After nesting duties are over they again turn their attention to waste material and become of smaller importance, whereas the superseded birds continue to be useful through the season. The House Sparrows are with us through the winter, showing no tendency to migrate, hence they are on the ground in the early spring, and when our native summer residents, which are with only one or two exceptions more or less migratory either as species or individuals, arrive, they find the most attractive nesting sites already occupied. The difficulty of keeping Sparrows out of nesting boxes is proof enough of this situation. They are quarrelsome, also, and though, when once established, most native species are quite able to hold their own against aggression, they do not like the constant turmoil in which they must engage when in the vicinity of the House Sparrow. Hence few other birds care to live in their immediate neighbourhood.

PLATE LII



A. House Sparrow; scale, $\frac{1}{3}$

Male Female



B. Common Redpoll; scale, $\frac{1}{3}$

Female or juvenile Male

The nests are great, bulky, untidy masses of straw and grasses and the tendency of these birds to fill down-spouts and load with litter every projecting architectural feature of buildings makes them objectionable. Added to the nesting habits of the House Sparrows, their congregation in numbers throughout the whole year in sheltered corners under cornices and porches causes accumulations of filth that is exasperating to the householder. Today one of the important problems in architectural offices is to design satisfactory detail that will not harbour Sparrows, whose dirt disfigures the most careful design and disintegrates the material of which the building is composed.

Without doubt the introduction of the House Sparrow into America was a mistake. It was known in its original home as a rather undesirable species and unfitted for the work it was brought over to perform. In this country, removed from the natural checks that kept it under control, it has multiplied beyond all reason and though its objectionable features have increased, its commendable ones have not. However, the House Sparrow is here to stay. It has been legislated against, and large sums have been spent in the attempt to control it, but without avail. Local endeavour reduces the number from time to time, but only to have new hordes pour in from surrounding country when the effort has spent itself. Constant endeavour will keep the numbers reduced, but only continent-wide persistent effort will destroy the species altogether. Traps, poison, and systematic destruction of the nests are the most satisfactory means of control. Poison is effective, but care must be taken that it is used only in the seasons and places where no other species have access to it. Wire fabric traps that are always set and will catch numbers at a time are the most satisfactory. A good type of such trap has been described by the United States Biological Survey in *Farmers' Bulletin 493.*

The common use of the automobile and the reduction of the number of horses on our streets and roads have given the first real check that the species has received in this country since it was introduced. In consequence of the reduced food supply, especially in winter, the number of the species is considerably less than it was a few years ago, and it seems as though this unexpected factor has done more to keep the House Sparrow within bounds than all the fulminations that have been directed against it.

521. **Red Crossbill.** AMERICAN CROSSBILL. CROSSBILL. *Loxia curvirostra.* L, 6·19. A small or medium-sized Sparrow with the bill tips prolonged and crossing each other when closed (Figure 261). The male is dull red, brighter on rump; females and juveniles similar, but the red replaced by greenish or yellow. No wing-bars. Many mixed and intergrading plumages between the green and red are to be met with; the red may vary from yellowish orange to pure brick red, and a series of specimens may show a bewildering array of different shades and tints.

Distinctions. The crossed bill is distinctive of the Crossbills; the lack of white wing-bar designates this species.

Field Marks. Small birds usually in winter, often in large flocks, some individuals showing red coloration. Notes somewhat similar to those of Goldfinches. Climbing, almost parrot-like, habits.

Nesting. Usually in coniferous trees; nest of twigs and grasses lined with moss and rootlets. May nest almost any month of the year from January to September.

Distribution. Europe, northern Asia, and northern North America. In America, the coniferous forests across the continent, south in the western mountains to Mexico. Migrates irregularly south in winter.

SUBSPECIES. The American Crossbill, occupying most of North America and all of Canada, is *Loxia curvirostra minor.* Other forms have been described from the west, but have not as yet been recognized in the Check-list.

The Crossbills are winter birds throughout most of settled Canada, and come irregularly out of the north for successive seasons, and then are not seen again, perhaps for years. In the mountains, where altitude brings northern conditions in close proximity to cultivation, they are more often seen. Like several other birds of similar irregular habits, especially their close relative the White-winged Crossbill, they are most uncertain in their breeding, both as to time and place, and their presence at any given season or locality can not be depended upon. Another peculiar thing about Crossbills of both species—and this applies also to the Pine Grosbeaks and Purple Finches—is that they have been suspected of assuming the bright red plumage in early maturity and losing it later; so that some of the common green plumages of the male may, after all, be the older adult instead of juvenile, as is usually assumed.

Economic Status. The species feeds very largely upon the seeds of coniferous trees, and the speed with which they husk off the scales of various cones for the seed beneath causes one to think that the crossed bill is particularly adapted for the purpose. Almost any dried fruit hanging on the winter trees is acceptable to them. They seem specially fond of the little woolly aphis. It was very interesting to watch a captive specimen open galls on poplar leaves. Seizing the fleshy tissue with the bill tips so that the points crossed within the mass, it gave a little twist of the head that split the gall wide open and the aphides within were removed with the tongue.

522. **White-winged Crossbill.** *Loxia leucoptera.* L, 6·05. Similar to preceding species, but with white bars on wings.

Distinctions. Perhaps brighter in coloration and a rosier red than the American Crossbill, but showing considerable variation in tint and shade. The white wing-bars and crossed bill are always diagnostic.

Field Marks. Similar to those of the Red Crossbill, but with a white bar on the wing.

Nesting. Usually in coniferous trees; in nest of twigs and grasses, lined with moss and rootlets. May nest almost any month of the year from January to September.

Distribution. Northern North America. In Canada, across the continent, through the northern coniferous forest, and south in the mountains to southern British Columbia. Migrates irregularly south in winter.

So similar to the preceding in habits and occurrence, that no special discussion is necessary. As a rule it is a bird of the spruces as the Red Crossbill is of the pines.

524. **Grey-crowned Rosy Finch** (Including **Hepburn's Rosy Finch**). GREY-CROWNED LEUCOSTICTE. PINK SNOWBIRD. *Leucosticte tephrocotis.* L, 6·15. A medium-sized Sparrow. Seal-brown over most of body; black cap; conspicuous patch of light grey on face and across nape; rump, flanks, and abdomen and the greater part of the wings washed with light rose.

Distinctions. A seal-brown Sparrow with considerable rose suffusion. Cannot be mistaken for any other species known to occur in Canada.

Nesting. Nest of bark and grass; on the ground, between or under rocks at high altitudes.

Distribution. Western North America. In Canada, breeding only in the mountains above timber-line in British Columbia and the Yukon. Comes in winter to lower levels, and spreads over the prairies, sometimes as far as Manitoba.

SUBSPECIES. Two subspecies of this bird are recognized. The type form, *Leucosticte tephrocotis tephrocotis*, is characterized by having the cheeks and ear-coverts brown, like the rest of the body. This is the bird of the main Rockies to central Yukon and Alaska. Hepburn's Rosy Finch *Leucosticte tephrocotis littoralis* has the grey of the face extended over the cheeks and ear-coverts, and sometimes across the chin. It is the representative of the species along the Coast range from Alaska peninsula southward. It is not confined to the immediate vicinity of the coast and the division between the two forms has not been well mapped. In the intermountain lowlands of British Columbia, both subspecies may occur in winter, even associated together in the same flock. On the plains, *tephrocotis* is the bird to be expected.

A most charming little bird, spending the summer on the snow edges of the highest mountains. In winter it comes in large flocks to the lowlands and even invades the streets of the foothill cities.

REDPOLLS (*See* Plate LII B)

General Description. Small Sparrows with short, sharp bills; crown with a dull crimson cap; a suffused black chin-spot; back and flanks streaked with browns, ashy, and white. Adult males have rosy breasts and the rump more or less tinged with pink; suggestions of this tint show in other plumages.

Distinctions. The small crimson cap is always distinctive.

Nesting. In low shrubs; nest of grasses lined with hair, often white rabbit or fox fur, feathers, or plant down.

Distribution. Circumpolar and Arctic in breeding range, migrating south irregularly in winter.

There are two species of Redpolls in Canada, divided into five subspecies, all so nearly alike that it requires special experience to differentiate them accurately. The dividing line between species is very fine, the subspecies intergrade, numerous hybrids have been reported, and, as considerable individual and age variation exists, it is only by attention to small details that the different forms can be separated.

The distinctive characters are given more as suggestions than as final differentiations.

Economic Status. See Redpoll Linnet.

527. **Hornemann's Redpoll** (Including **Hoary Redpoll**). *Acanthis hornemanni.* L, 5. Light-coloured Redpolls with unspotted white or rosy rump. Characteristic adults with feather edgings light so that a typical bird looks like a Common Redpoll (Plate LII B) seen through a white veil, but many birds, even in breeding maturity, show little of this frosting and are inseparable from the Common Redpoll except by other characters.

Distinctions. The rump, unspotted or unstriped, is the best means of separating this species from other Redpolls, although this point is sometimes not easy to determine.

Distribution. The Arctic and sub-arctic parts of the northern hemisphere. In America, breeding across the Arctic, migrating throughout most Canadian provinces in the winter.

SUBSPECIES. The Hoary Redpoll *Acanthis hornemanni exilipes* is the American form of this species, and the only one so far reported from western Canada.

In general habits so nearly like the next species, which is much more common, that separate discussion is unnecessary. This species is generally so rare in settled districts that its identification must be made with caution. During occasional winters this species occurs in greater or less numbers with large flocks of the Common Redpoll, but there is no regularity in its visits.

528. **Redpoll Linnet** (Including **Greater** and **Holboell's Redpoll**). *Acanthis linaria.* L, 5—5·5. Plate LII B. A rather dark Redpoll with rump more or less heavily streaked, and body not noticeably frosted with white.

Distinctions. The streaked rump is the most distinctive character.

Distribution. Northern parts of northern hemisphere. In America, breeding across the Arctic regions. Migrates in winter practically everywhere in Canada.

SUBSPECIES. The species is divided into three subspecies; the Common Redpoll *Acanthis linaria linaria* which is commonest in fact as well as name; Holboell's Redpoll *Acanthis linaria holboelli*, a slightly larger form; and the Greater Redpoll *Acanthis linaria* *rostrata*, the largest of the species. There are small differences visible to the eye of the expert in the bills and details of coloration, but size is, on the whole, the best criterion though it should not be entirely relied upon as intergrades occur. The wing of the Common Redpoll should be 2·9 inches, Holboell's 3·0 with slightly longer bill, and the Greater 3·5 with bill shorter and stouter. However, in identifying Redpolls it should be remembered that the Common is the one likely to be met with anywhere in Canada, and, though Redpolls are likely to wander widely in winter, we have no definite evidence of any other form of *linaria* than the Common Redpoll west of the Great Lakes.

With more or less regularity our winter fields and waste lands are taken possession of by immense flocks of tiny Sparrows, feeding on the weed-tops which project from the snow, or perching in the low trees and bushes nearby. From many little throats comes a subdued but constant twitter, no one of the birds producing a song in the usual sense of the word, but collectively making an undercurrent of low music that is distinctly agreeable. The round, fluffy, heavily plumaged bodies; the little, rich crimson cap; and the occasional flash of rosy breast and pink rump declare them Redpolls. They are tame and unsuspecting little fellows and if the observer conducts himself discreetly they may at times alight all about him, or even upon his person, with as much indifference as if he were a stump or some other inanimate feature of the landscape. They remain until the spring breakup when they vanish until another winter. Their winter wanderings are irregular and erratic.

Economic Status. Coming in flocks of large numbers and searching weed-tops diligently the Redpolls should be hailed by the farmer with pleasure, not only for their pretty ways but also for the evident good they do in destroying weed seed. One cannot go over the ground where they have fed and examine it closely without being impressed with the amount of good work they have done. Their tracks are seen everywhere in the snow and every little weed-top seems to have been scrutinized with microscopic eye. Considering their numbers and that they come in the coldest weather, when they require much food, it is evident that their presence must have a marked deterrent effect upon the following season's weed crop.

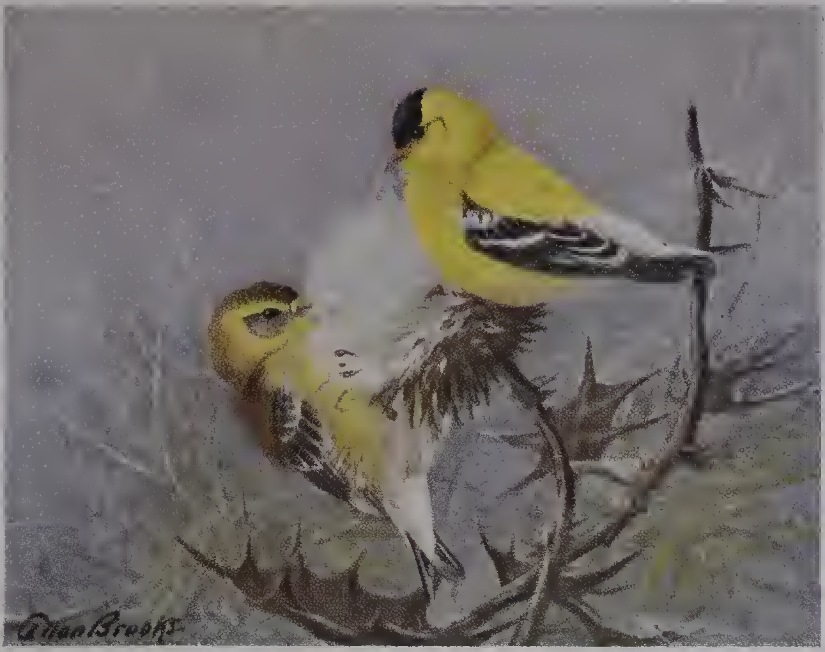
529. **American Goldfinch** (Including **Pale** and **Willow Goldfinches**). THISTLE-BIRD. WILD CANARY. *Astragalinus tristis*. L, 5·10. Plate LIII A. A small, canary-like bird. Spring male: bright lemon yellow with black cap, wings, and tail. Females: generally similar, but without black cap; the wings and tail more brown than black and yellow overwashed, especially on upper parts, with olive green. Winter birds of both sexes similar to the summer female, but colours still further flattened and greyed, and almost pure white below. The male, however, still retains his black wings and tail, but broadly feather-edged with white.

Distinctions. The summer male, with strongly contrasted black and yellow, can be mistaken for no other species. The female, except for its typical sparrow bill, might be confused with some of the small, green Warblers or Vireos. In winter, the colours are less distinctive, but there is always a suggestion of yellow about the head and back if not elsewhere, and the wings of the male, at least, remain decidedly black with only edgings of white or buffy. Separated from the Pine Siskin by an entire lack of streakiness in any plumage.

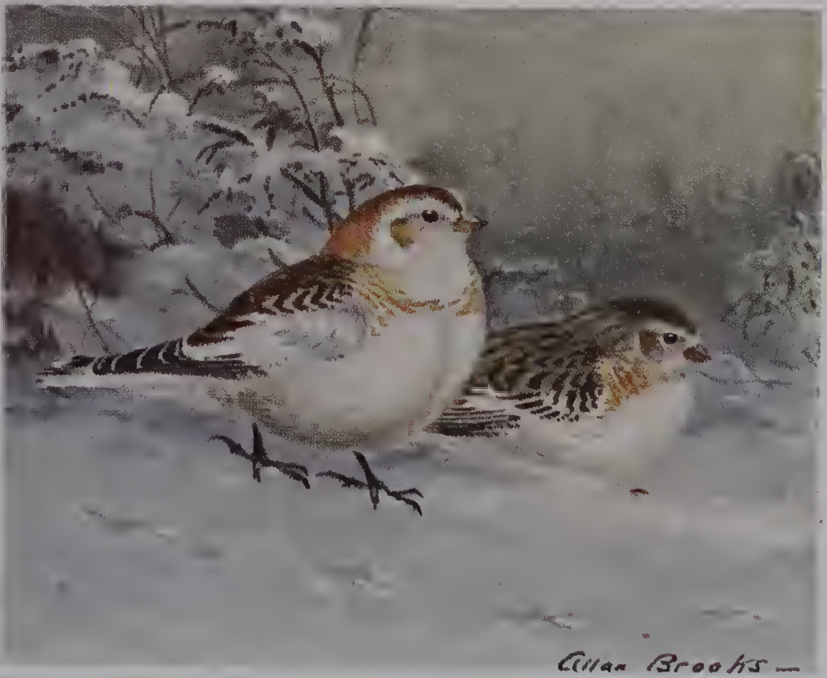
Field Marks. Bright yellow, or general yellow and green colour, with black wings and tail. By actions and form, obviously Sparrows, and not Warblers or Vireos. In habit, notes, and disposition, Goldfinches resemble Pine Siskins or Crossbills, but are distinguished from the first by their lack of streakiness and from the latter by absence of any shade of red, lighter coloration when in green plumage, and white uppertail coverts.

Nesting. Nest of grasses and plant down, lined with the latter.

Distribution. North America, from southern Canada, south. In Canada, across the southern parts.



A. American Goldfinch; scale, $\frac{1}{3}$
Female Male



B. Snow Bunting; scale, $\frac{1}{3}$

SUBSPECIES. Three subspecies of Goldfinch are recognized in western Canada. The Eastern Goldfinch *Astragalinus tristis tristis* extends west to eastern Manitoba. In the interior of British Columbia is the Pale Goldfinch *Astragalinus tristis pallidus,* a bird practically indistinguishable in summer from *tristis,* but much paler in the winter plumage. The form of the prairies, from western Manitoba to the mountains, is postulated to be *pallidus.* However, corroborative specimens have not been seen by the writer. Late autumn and winter specimens are greatly to be desired from this area. The bird of the southern British Columbia coast is the Willow Goldfinch *Astragalinus tristis salicamans,* which has a slightly darker coloration even than *tristis,* and the saddle of the summer male averages a more olive-green. The distinctions shown by Canadian specimens, except in the case of the winter plumage of *pallidus,* are very fine indeed.

One of the merriest of summer birds. It is a great lover of fluffy white thistle and dandelion seed-heads and may often be seen plucking the down, cutting off the fruiting end, and letting the airy tops float away on the wind. Its song is as pleasant as its bright appearance as it sits on some lone elevation and sings *"Sweet-sweet-chewit-chewit-chewit"* or as it goes speeding off through the air in a merry flock repeating a cheerful *"Per-chic-o-pee."* The American Goldfinch, though a relative of the Old World bird of the same name, is an entirely different species, named, as the original settlers named many birds, from various fancied or real resemblances to the familiar forms known at home.

Economic Status. A bird of no bad habits and many good ones. Weed-seeds are its staple food, and grain is rarely touched. If the House or English Sparrows do not exhaust the supply prematurely, sunflower seed-heads are a never-failing attraction to Goldfinches and a supply of these along the back fence will ensure their constant attendance through the autumn and winter. Insects are taken more or less and some fruit, usually wild species, as no complaint is made of any damage done to cultivated varieties.

533. **Pine Siskin.** *Spinus pinus.* L, 5. Small, goldfinch-like birds striped with olive-brown on a dull white ground, some slightly tinged with yellowish; lighter below and a lemon-yellow spot and suffusion on the wings.

Distinctions. General streakiness and suffused yellow wing-spot.

Field Marks. Goldfinch-like habits and voice, and general streakiness.

Nesting. In coniferous trees; nest of twigs and rootlets lined with plant down.

Distribution. North America. Breeding in the northern coniferous woods across the continent, and down the mountains in the west to Lower California. An irregular migrant throughout all southern Canada; breeding locally in suitable localities.

This is another of the irregular, sporadic winter wanderers. It is as irregular in its nesting, both in time and place, and individuals in evident breeding condition may be found in midsummer in large flocks of supposedly non-breeding birds.

Economic Status. As it is usually only a winter visitor to cultivated sections, and shows strong partiality for the fruit of coniferous trees, it is a neutral species, perhaps doing no great good but certainly no harm.

534. **Snow Bunting.** SNOWFLAKE. *Plectrophenax nivalis.* L, 6·88. Plate LIII B. A medium-sized Sparrow, showing much white. In breeding plumage, assumed only on the nesting grounds in the Arctic regions, almost immaculate white with black saddle across shoulders. Flight and tail feathers black, with almost equal areas white. As they visit lower latitudes, however, they are heavily veiled over head and throat with rusty, and the black feathers are all edged with rusty ochre and white.

Distinctions. Sharply contrasting black and white colouring with most of the feathers heavily bordered with rusty, especially on the head, back, and breast-band. Through the winter the rusty borders gradually wear off and the breeding plumage of black and white results without moult. The general scheme of colouring of the Snow Bunting is found in no other Canadian bird.

Field Marks. Very white, gregarious ground Sparrows showing large amounts of white on black wings when flying.

Nesting. On the ground in moss, nest of grass, rootlets, and moss lined with feathers and fur.

Distribution. Circumpolar Arctics. In Canada, breeding from the edge of Barrengrounds northward across the continent. In migration, throughout Canada.

SUBSPECIES. Only one of the two recognized subspecies, the Common Snow Bunting *Plectrophenax nivalis nivalis*, is known to occur in Canada.

Winter visitors in southern Canada, feeding on the weed-tops that project from the snow in open fields and rarely perching in trees. A flock alights in the weed-spotted snow and gradually works across it, the rear of the flock rising up from time to time like a flurry of snow and pitching ahead, the process being repeated until the whole field has been gone over.

536. **Lapland Longspur** (Including **Alaska Longspur**). *Calcarius lapponicus.* L, 6·25. Plate LIV A. Adult male: streaked with dark brown, buff, and traces of ruddy ochre above; bright chestnut nape and hindneck band. Crown, black, broken by more or less defined median stripe of light ochre. Below, white with black throat, foreneck, and face; a white superciliary line. Black stripes and spots along flank. Females and younger males similar in general colour plan, but dingier and without solid colour anywhere. The chestnut nape always present or suggested, and the black of the face and foreparts represented by veiled, broken masses about the edges of the areas. Some autumn juveniles are mostly streaky ochreous, lightening to white on abdomen. The nail of the hind toe is elongated as in the Horned Lark (*See* Figure 250).

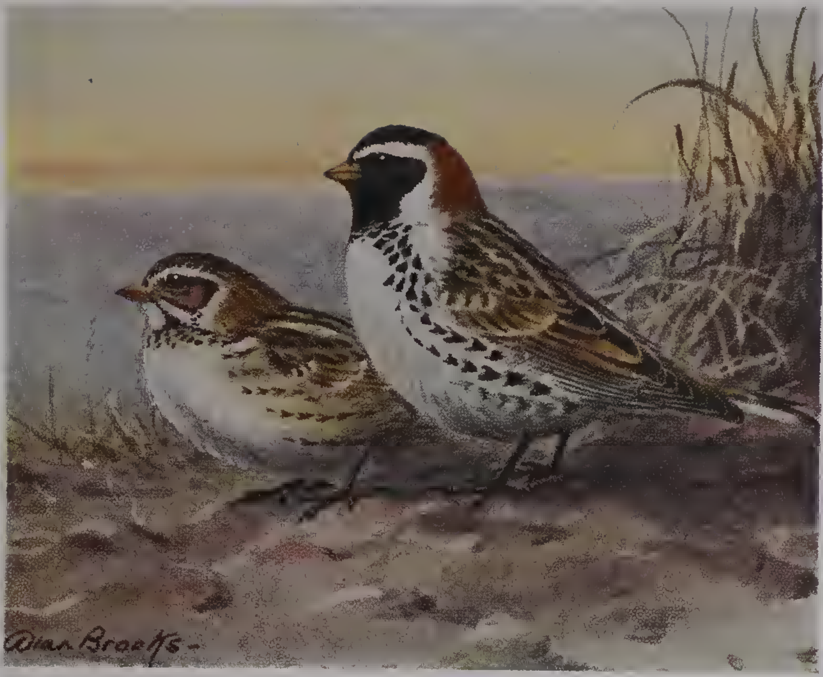
Distinctions. In the hand, only likely to be mistaken for one of the other Longspurs. The adult male has the throat black like the face, instead of white as in McCown's, or buffy as in Smith's and the Chestnut-collared Longspurs. Harris' Sparrow has a similar black face and bib, but is otherwise an entirely different-appearing bird, with light grey ear-coverts, and no chestnut collar. Females and juveniles with the distinct or semi-obscured chestnut collar are easily separated from McCown's and Smith's, but may be very similar to the Chestnut-collared. They are distinctly larger birds, however, wing 3·50 and over, instead of 3·25 or under, and the collar is well developed instead of vaguely defined or absent. The whole bird is more sharply streaked. The black suffuses around ear-coverts and across the lower neck, and the underparts are solid white. Female and juvenile Chestnut-collared Longspurs may have a veiled black spot below a light throat, but the abdomen is a dusty buffy and usually shows more or less irregular intrusion of black. Autumn juveniles are still more confusing. They have a general appearance of a streaked buffy bird, with white, rarely cream, abdomen, with but traces of veiled black down sides of throat from corners of bill, and across upper breast. The tips of the ear-coverts are bordered by a conspicuous brown or black patch that is absent in the Chestnut-collared and McCown's Longspurs and much smaller or absent in Smith's. The best test for the species, in this plumage, is the white or faintly cream abdomen.

Field Marks. By habit and association much like the Snow Bunting, the Horned Lark, or the other Longspurs. Lack of the great amount of white, especially in wings, and the coarser, harsher note will separate from the Snow Bunting; sparrow bill and lack of yellow throat or ear tufts, and undulating flight, from the Horned Lark. The adult male, with his black face and bib, is distinct from the other Longspurs. In addition to details previously mentioned, other plumages are more streaky than other Longspurs, and never as evenly buffy as Smith's. It is only a spring and autumn migrant, and not to be met with in southern Canada in summer when the Chestnut-collared and McCown's Longspurs are most common.

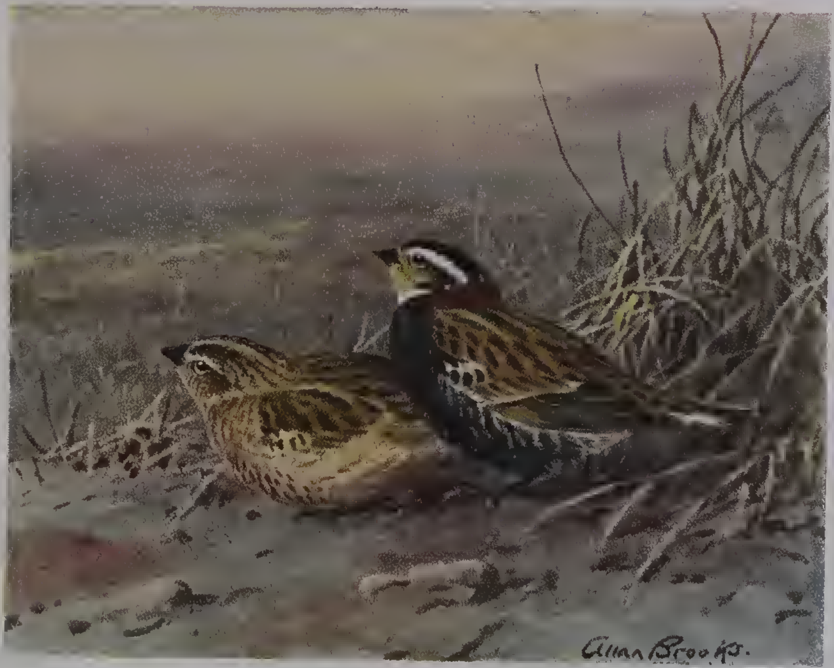
Distribution. The greater part of the northern hemisphere, breeding in the Arctics and migrating or wintering throughout southern Canada.

SUBSPECIES. Two subspecies are recognized in Canada. The form common to Europe and eastern America is the type one, *Calcarius lapponicus lapponicus*. The Alaska Longspur *Calcarius lapponicus alascensis* breeds in Alaska and east towards the Mackenzie. The subspecific distinction is slight and the boundaries of the ranges are not well defined. On the western prairies and in British Columbia, both forms may occur during migration.

In the autumn, when most of the other Longspurs, the Chestnut-collared and McCown's, have departed for the south, the sere-frosted prairies are visited by flocks of innumerable ground Sparrows. They rise from the



A. Lapland Longspur; scale, $\frac{1}{3}$
Female Male



B. Chestnut-collared Longspur; scale, $\frac{1}{3}$
Female Male

ground ahead of the observer in small groups and large flocks with happy undulating flight, lilting a merry chorus of little "*chirs*." Most of these are Lapland Longspurs, though occasional flocks of Smith's occur.

Economic Status. Coming as they do in early spring and autumn, weed-seed is about all that they can attack. Their myriad numbers and the closeness with which they search the ground must be responsible for an enormous consumption of weed-seed.

537. **Smith's Longspur.** PAINTED LONGSPUR. *Calcarius pictus.* L, 6·50. A brownish buffy bird, striped with brown above. Adult male with black crown; a white superciliary line; cheek black with white spot in centre and with narrow white line below, separating the black from the pale warm buff throat, which latter colour extends evenly over all lower parts, but is ruddiest on breast (Figure 262). Lesser wing-coverts black with a large white spot. Females are similar, but have the black and white head marks replaced by buffy stripes on crown and a dark spot at tip of ear-coverts, like the autumn juvenile Lapland Longspur. Autumn juveniles are like the female, but with less white on wing-coverts.

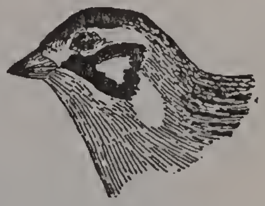


Figure 262
Smith's Longspur; scale, ½.

Distinctions. A generally buffy bird. The spring male, with its striking black and white head-marking, is unmistakable. Females and juveniles very like juvenile Lapland Longspurs, but buffier and with the abdomen almost concolour with breast instead of being nearly or quite white. At a glance, somewhat like the female or autumn Bobolink, but more even and of a ruddier buff, and the crown without a well-marked median line. One of the largest of the Longspurs.

Field Marks. Spring male a buffy bird, with strikingly patterned black and white head, buff throat, and breast. The most buffy of the Longspurs.

Nesting. On the ground, on the northern Barren-grounds.

Distribution. The interior of North America. Breeds from Mackenzie river to Hudson bay, migrates through the Prairie Provinces, and has occurred in British Columbia.

Only a migrant in cultivated Canada, passing though quickly in spring and autumn. Not nearly so common nor so generally distributed as the Lapland Longspur, but appearing in flocks of considerable size when it does occur.

538. **Chestnut-collared Longspur.** *Calcarius ornatus.* L, 5·85. Plate LIV B. A smaller Longspur than the preceding two. Spring male: breast and most of underparts, black, often more or less tipped with grey feather-edges and sometimes with chestnut. Throat and face cream; crown and tips of ear-coverts, black. A strong, white, superciliary line. A distinct chestnut collar about nape and base of neck. Back streaked in shades of brown and ashy-ochre. Female: dull ashy-brown, striped above, but often the streaks are nearly worn away. Throat generally light to white, and usually more or less black feather bases showing vaguely through the light of the breast and underparts. Autumn juveniles show very little distinctive character, mostly ashy-ochre, softly streaked with brown above.

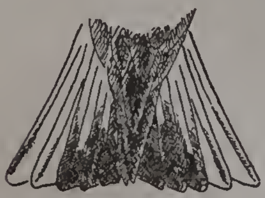


Figure 263
Tail of Chestnut-collared Longspur; scale, ½.

Distinctions. The smallest of the Longspurs (wing 3·25 or under). The spring male is unmistakable, with cream throat and face, black breast, and underparts. The Lapland Longspur has a similar chestnut collar, but has black throat and is white beneath. The latter is, however, only a migrant through southern Canada, instead of a summer resident. In summer, needs to be separated only from McCown's Longspur, which is larger and has a white throat, face, and underparts, and a crescentic black gorget across the breast. Females are light ashy-grey, softly striped above and nearly uniform below, like those of the Chestnut-collared, but are decidedly whiter, being ashy rather than ochreish. Females and juveniles are best distinguished from other Longspurs by smaller size.

Field Marks. Adult male: a small Sparrow with creamy throat, black breast, and underparts. Females: best distinguished in life by association with male, but separated from Vesper Sparrow, which may be similar in general colour effect, by much more white on sides of tail, two and a half or more feathers white, instead of little more than one, the area of white increasing towards the base of tail (Figure 263), instead of an even border; from McCown's Longspur by having less white in tail, all the tail of the latter, except a terminal band and centre feathers, being white (Compare with Figure 264). The Chestnut-collared, in common with McCown's, has a very pretty flight-song that is given when the wings are extended high over the back, as it slowly drops from a height.

Nesting. On the ground on the open prairie; nest of grasses and rootlets.

Distribution. Great Plains region of North America. In Canada, all of the prairie section. A casual straggler in British Columbia.

In many parts of the prairies, especially the more arid sections, one of the commonest and most characteristic birds. In the bright spring and early summer days, its beautiful twittering flight song, repeated on every hand by many rival birds, gives a delightful air of gladness to the awakening prairies.

539. **McCown's Longspur.** *Rhynchophanes mccowni.* L, 6·0. Spring male: streaked in ashy ochre and brown above, and a black cap; underparts, throat, and face, white with a black streak from corner of bill, and a black crescentic gorget across breast. White of throat extending around back of neck in a grey collar, and ear-coverts ashy grey (Figure 265). Lesser wing-coverts chestnut. Female generally ashy-grey, softly streaked with brown above, and nearly even white below; slightly ashy across breast. Juvenile very much like that of Chestnut-collared Longspur, but larger and more white in tail. All the feathers of the tail, except middle ones, white, tipped with dark (Figure 264, compare with 263).

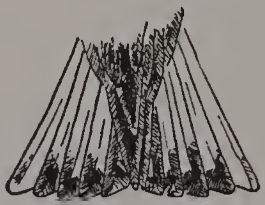


Figure 264
Tail of McCown's Longspur; scale, ½.

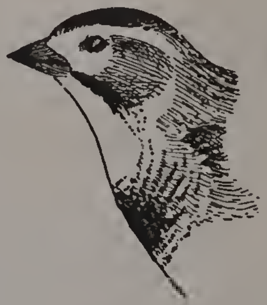


Figure 265
McCown's Longspur; scale, ½.

Distinctions. The spring male, with its black cap and white face, and throat bordered by black crescentic gorget, is unmistakable. The female and juveniles are very much like those of the Chestnut-collared Longspur, but more ashy in general coloration and with much more white in the tail. Size is a good distinction from that species (wing over 3·25). The back is not as strongly streaked as in the Lapland Longspur, and there is no dark spot about the ear-covert tips as in the Lapland and Smith's.

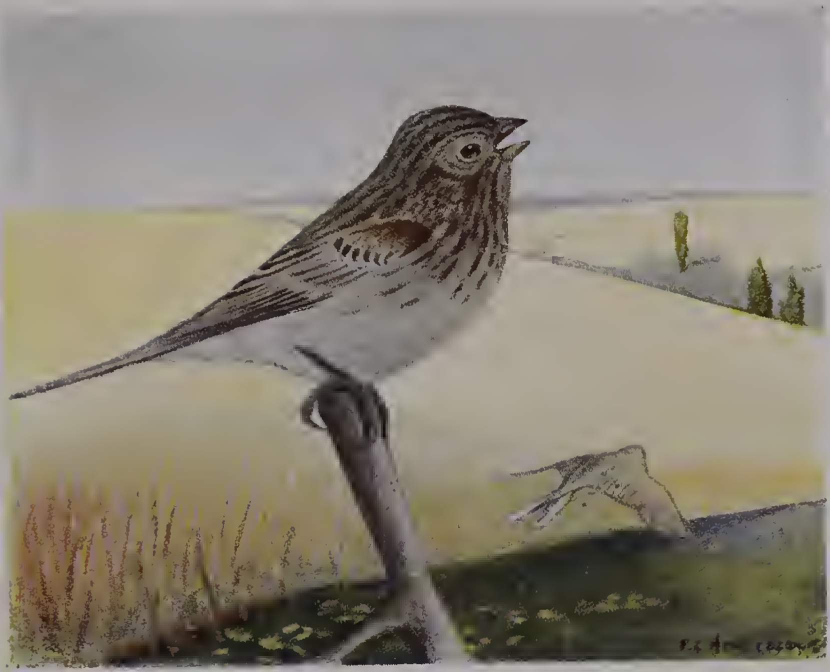
Field Marks. As a summer resident in southern Canada, usually requiring separation only from the Chestnut-collared Longspur. Adult male: black-crowned, white-throated, with light face and crescent-shaped black gorget across breast. Females are best distinguished in life by association with male, but separated from the Vesper Sparrow, which may have similar general colour effect, and the Chestnut-collared Longspur, by the large amount of white in tail (Figure 264, compare with 263 and 266), all the tail, except the middle feathers and a terminal bar, being white.

In common with the Chestnut-collared Longspur, the male has a charming flight-song that is given while slowly dropping from a height, with wings extended high over the back.

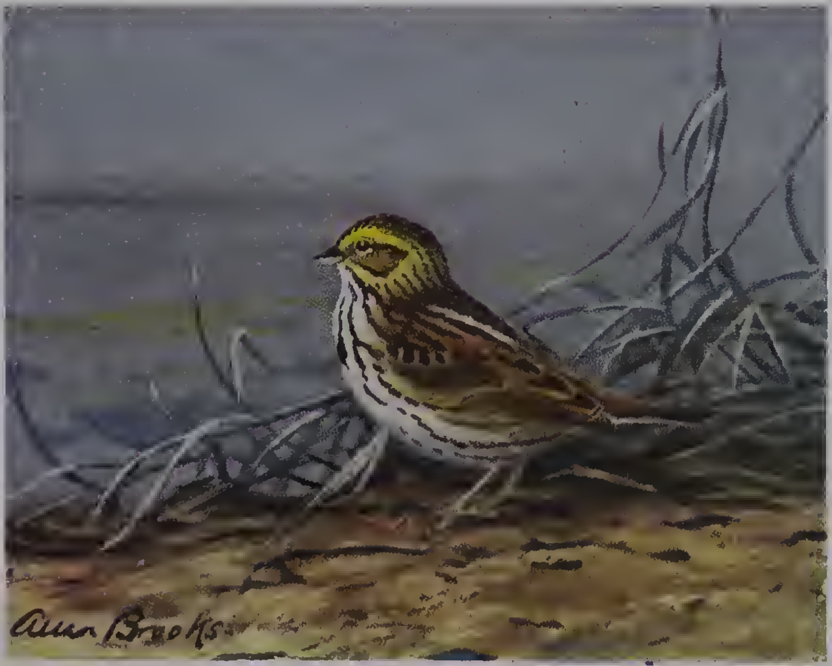
Distribution. The Great Plains region of North America. In Canada, regularly only in the dryer parts of the prairies of Saskatchewan and Alberta. It is irregular and local in distribution, but has been taken at Chilliwack, British Columbia.

Very much the same habits and disposition as the preceding species.

PLATE LV



A. Vesper Sparrow; scale, $\frac{1}{3}$



B. Savannah Sparrow; scale, $\frac{1}{3}$

540. **Vesper Sparrow** (Including **Western** and **Oregon Vesper Sparrows**). GRASS FINCH. BAY-WINGED SPARROW. *Pooecetes gramineus.* L, 5·75. Plate LV A. A dull, earth-coloured ground-bird; softly streaked with shades of brown above; below, white, with suffused brown streaks across breast, on sides of throat and flanks. Lesser wing-coverts, brownish red. Tail dark with white outer feather on each side (Figure 266).

Distinctions. Like a number of ground Sparrows, especially the Song Sparrow, but characterized by the red-brown (bay) shoulders and white outer tail feathers. Spotting on breast softer and less profuse than on the Song Sparrow, and not aggregated into a central breast-spot.

Field Marks. An earth-coloured Sparrow, with white breast streaked with dark. Separated from the Song Sparrow by lack of central breast-spot and the presence of white outer tail feathers. The Junco has similar white tail feathers, but is a darker and more slaty (or rufous) bird. Somewhat suggestive of the juvenile Longspurs, but the breast streaked, and much less white in tail (Figure 266, compare with 263 and 264).

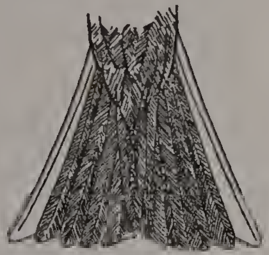


Figure 266
Tail of Vesper Sparrow; scale, $\frac{1}{3}$.

Nesting. In the grass; nest of grasses, rootlets, and hairs.

Distribution. Temperate North America. In Canada, across the continent, north into the edges of the northern forest.

SUBSPECIES. Two subspecies are recognized in western Canada. All birds west of the Great Lakes are generally referred to the Western Vesper Sparrow *Pooecetes gramineus confinis.* It is lighter and greyer than the eastern type race, and averages a little longer in the tail. The Oregon Vesper Sparrow *Pooecetes gramineus affinis,* a smaller, buffy bird, has been identified from the southern British Columbia coast.

The Vesper Sparrow is comparable with the Song Sparrow in its habits, song, and general appearance. It is less a bird of the brush, however, and usually frequents the edges of fields, or where there is slight cover or long weeds, as in the vicinity of ditches or roads. Its song is similar to that of the Song Sparrow, but may be readily distinguished from it by the experienced ear, particularly by its not beginning with the two, or more, single notes.

Economic Status. This is one of the most beneficial of the Sparrows. It feeds farther afield than most of the common summer Sparrows and takes a greater percentage of insects than they, and large quantities of weed seeds. Some grain is found in its stomach, but in circumstances that point to its being waste from the stubble or roadways. The Vesper Sparrow, therefore, should receive every possible protection.

542. **Savannah Sparrow** (Including **Western** and **Aleutian Savannah Sparrows**). *Passerculus sandwichensis.* L, 5·68. Plate LV B. A rather small Sparrow striped above with brown, ashy, and intermediate shades. Below, white with sharp brown streaks on the breast, flanks, and in some cases on the throat. Yellow on the bend of the wing and a spot in front of the eye. Autumn birds are generally overwashed with buffy and the markings are softer and more diffused.

Distinctions. The Savannah Sparrow may be distinguished from the Song Sparrow by the yellow spots in front of the eye and on the bend of the wing and by the lack of the aggregated streaks which form a spot in the middle of the breast of the Song Sparrow.

Field Marks. The Savannah Sparrow may be recognized in the field by striped breast, yellow line over the eye, and by its notes. Its song is a fine, insect-like "*Tsip-tsip-you-re-e-e-e-e-you,*" the first notes often too faint to be heard and the whole with a peculiar far-carrying intensity and high pitch that leave one in doubt whether it is close at hand or very far away.

Nesting. On the ground, in nest of grasses lined with finer material.

Distribution. North America, north to the Arctic coast. Breeds practically everywhere in Canada except on the Arctic islands.

SUPSPECIES. Divided into a number of subspecies, of which the following are recognized in the Check-list as occurring in Canada. The Aleutian Savannah Sparrow *Passerculus sandwichensis sandwichensis* breeds on the western Alaskan islands and migrates along the British Columbia coast. This is a large bird, somewhat rufous in colour and with bright yellow lores and eyebrow stripes. The Eastern Savannah Sparrow *Passerculus sandwichensis savanna* is the bird of the east and may extend west to eastern Manitoba. It is slightly darker, with the eye stripe brighter yellow than the next. The Western Savannah Sparrow *Passerculus sandwichensis alaudinus* is supposed to range from Manitoba west to the Pacific coast. It is a paler, greyer form, with eye stripe dull or even white. But all the birds of this region do not agree with this description, and further study of the characteristics of the subspecies is desirable. Probably some other forms will have to be recognized, amongst them a small, dull-coloured one in southwestern British Columbia, *Passerculus sandwichensis brooksi.*

A bird of damp meadows and waste land, where the grass grows in rank and coarse bunches and water lies close to the surface; or of sandy barrens where the grass and weeds grow in scattered clumps. It runs in the grass like a mouse and rises with a low quick flight, often before a good view of it can be obtained. It is an interesting little bird, but is so inconspicuous as easily to pass unnoticed by the casual observer.

Economic Status. Besides great quantities of weed seed, the Savannah Sparrow consumes more insects than do most sparrows, and more beetles than any other. These beetles include a great number of weevils and other harmful forms. Although inhabiting waste places it frequents cultivated land often enough to make it an efficient helper to the agriculturist.

545. **Baird's Sparrow.** *Ammodramus bairdi.* L, 5·25. Like the Savannah Sparrow (*See* Plate LV B), but all markings sharper, shorter, and sparser. The face and hind-neck suffused with light ochre, warming to burnt orange in the broken, median crown-stripe. No lemon yellow on lores or bend of wing.

Distinctions. The ochre and dull orange background of face and crown separates it from all other species.

Field Marks. A Savannah sparrow-like bird with warm ochre suffusion over face and head. Markings clearer and sharper, white more general, are the best recognition marks for the eye. The best identification, however, is by the voice. Instead of the insipid insect-like little trill of the Savannah Sparrow, it utters quite a little warble, "*Zip-zip-zip-zre-e-eeeeeee,*" the opening "*zips*" being very plain and characteristic.

Nesting. On the ground in the grass.

Distribution. The Great Plains of North America. In Canada, the southern prairies.

Though widely distributed over the prairies, this species is rather local. It inhabits damp ground around sloughs, but is specially partial to dry alkaline flats a little back from shrinking pools. Amidst the great number of Savannah Sparrows and other small species in such places, it is very inconspicuous, as is indicated by the fact that, though the country it inhabits had been often visited by ornithologists, it was thirty years after the first specimen had been brought to the attention of science before the species was rediscovered as common in Colorado and Dakota.

546. **Grasshopper Sparrow.** YELLOW-WINGED SPARROW. *Ammodramus savannarum.* L, 5·38. A small grass-haunting Sparrow. Back marked with fine, short streaks of brown, ashy, and light buff in indefinite pattern; dull white below, with a light buffy wash across the breast fading away on the sides of the throat. A yellow spot in front of the eye; upper wing-coverts and the bend of the wing yellow or yellowish. In fresh, unworn plumage, a condition of specimen that is but rarely secured, the back shows many light semi-circles that give a scaly appearance. There is a decided vinaceous general cast owing to considerable red or bay that later wears or fades away. Tail of sharply-pointed feathers like Figure 267.

Distinctions. The yellowish upper wing-coverts are distinctive of the species. The unstriped and unspotted breast will separate it from most of the other small grass Sparrows.

Field Marks. This species can be distinguished from most of the other small Sparrows by its unstreaked, faintly buff-coloured breast. Its song is like the last part of the song of the Savannah Sparrow, without the opening phrase and final syllable, and dies gradually away like "*Bz-bz-bz-z-z-z-z.*"

Nesting. On the ground, in nest of grasses, arched over.

Distribution. United States, to South America. In western Canada, only known from a small area in southwestern Manitoba and Okanagan valley in British Columbia.

A most inconspicuous little ground Sparrow, inhabiting dry, grassy meadows and to be sought for by ear rather than eye. It may be expected in southeastern Saskatchewan.

548. **Leconte's Sparrow.** *Passerherbulus lecontei.* L, 5. A very small Sparrow, streaked above and on flanks. Tail feathers sharp and tapering (Figure 267). Adult: crown, dark brown with greyish-buff median stripe. Nape, vinaceous, with greyish edgings. Back, dark brown with light buff stripes. Suffused with ochre on breast, throat, and superciliary line. Grey cheeks, and a brown line back from eye. Abdomen white. Juveniles are streaky ochre and brown. More heavily streaked above; paling to nearly white on abdomen. Finely striped across breast and on flanks, but clear elsewhere below.

Distinctions. Among the smallest of the sparrows. Most likely to be confused with Nelson's Sparrow. Adult separated from it by the vinaceous nape-band and lack of any tendency towards olive or green on back. The Grasshopper Sparrow has also a vinaceous nape, but the lesser wing-coverts and bend of wing are yellow. The juvenile of Leconte's is very like that of Nelson's, but is generally a paler ochre, lightening to almost white on abdomen, and finely but distinctly streaked across breast.

Field Marks. A diminutive Sparrow that gets up from the long grass, flies a short way, and drops into it again, is probably this or the next species. Only close observation of the colour characters above, or familiarity with their notes, will separate them in life. This species is not quite as closely confined to damp or wet ground as Nelson's.

Nesting. On the ground; nest of fine grass.

Distribution. Central North America. In Canada, the Prairie Provinces, north occasionally to Great Slave lake.

A very inconspicuous bird that only a careful observer will note or identify.

549. **Nelson's Sharp-tailed Sparrow** (Including **Prairie Sharp-tailed Sparrow**). *Passerherbulus nelsoni.* A very small Sparrow with sharp, tapering tail feathers like Leconte's (*See* Figure 267); streaked above and on flanks. Adult: crown dark brown with slate-grey median stripe. Nape-band, slaty-olive. Back, dark brown with white stripes. Below, white with rich ochre breast-band, extending up sides of neck over face, producing strong superciliary line. Cheeks, grey with dark stripe back from eye. Juveniles are rich ochre over all, striped above with brown, and with no suggestion of white any place.

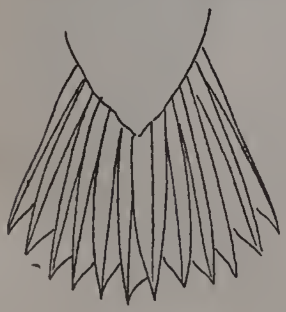


Figure 267
Tail of Sharp-tailed Sparrow; scale, ½.

Distinctions. Among the smallest of the Sparrows. Very likely to be confused with Leconte's Sparrow. Adult certainly separated from it by the olive or slaty-olive nape-band and sharp white feather-edge stripes on back. The juvenile is even more like Leconte's, but has no stripes on breast or undersurface, and the ochre is deep and rich, lighter on abdomen, but never approaching white.

Field Marks. A diminutive Sparrow that gets up from the long grass in damp or wet places, flies a short way, and drops into it again, and then steals mouse-like through the cover, is probably either this species or Leconte's. Only close observation of the colour characters above, or familiarity with their notes, will separate them in life.

Nesting. On the ground; nest of fine grass.

Distribution. Eastern North America. In western Canada, throughout the prairie regions (except the southwestern?); north, occasionally, to Great Slave lake.

SUBSPECIES. The Nelson's Sharp-tailed of the west is the Prairie Sharp-tailed Sparrow *Passerherbulus nelsoni nelsoni,* and is a stronger and more richly coloured bird than the Acadian Sharp-tail of the Atlantic coast.

Another of the inconspicuous little grass Sparrows, that none but the keenest observer will see or recognize.

552. **Lark Sparrow** (Including **Western Lark Sparrow**). *Chondestes grammacus.* L, 6·25. A very striking and conspicuously marked Sparrow. Above, striped with brown and buffy brown; below, white with buffy flanks. Crown, chestnut-brown with conspicuous white median line; ear-coverts chestnut-brown in strong contrast with the white face; and three sharp, black lines, one through eye, one from lower mandible to ear-coverts, and one along sides of throat (Figure 268). Outer tail feathers and ends of all except the middle ones, white.

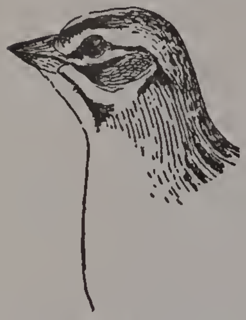


Figure 268
Lark Sparrow;
scale, ½.

Distinctions. The bright reddish-brown ear-coverts contrasting with black and white face are certain distinguishing characters of the species.

Field Marks. The strongly marked head and face and the large amount of white in the tail make easily recognized field marks.

Nesting. In low trees or bushes, in nest of grasses lined with fine grass, rootlets, and hairs.

Distribution. Mississippi valley to the Pacific coast. In western Canada, along the southern border of the Prairie Provinces and the interior warm valleys of southern British Columbia.

SUBSPECIES. The subspecies of western Canada is the Western Lark Sparrow *Chondestes grammacus strigatus,* a slightly lighter bird than the Eastern race.

In the open brushy wastes of the bad lands, where the creek beds, between raw, eroded banks, are lined with occasional poplars, backed by dry sagebrush benches, the Lark Sparrow is most common. It is not entirely confined to such places, for an open, park-like area with scattered tree growth is another favourite haunt. It has a pleasing little song, and its bright, happy ways gladden many an otherwise monotonous landscape.

553. **Harris's Sparrow.** *Zonotrichia querula.* L, 7·50. A large Sparrow. Above, striped in shades of brown and brownish ash with a black crown, throat, and upper breast; cheeks ashy-grey, and underparts pure white. Adults of both sexes, spring and autumn, practically alike. Juveniles similar, but the black crown broken, the face ochraceous to base of bill; throat white, the black being confined to a conspicuous breast-spot.

Distinctions. A large Sparrow; white below, with black cap, face, and throat, or with a large black spot across breast.

Field Marks. A large, black and white Sparrow, with black face and throat or large black spot across centre of breast.

Nesting. On the ground under bushes; nest of grass. Nest rarely discovered.

Distribution. Central North America; north to edges of Barren-grounds. Nesting area little known. In Canada, migrating throughout all the prairie sections. Occurring rarely, but with increasing frequency, in winter, in southern British Columbia.

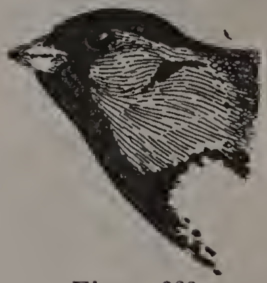


Figure 269
Harris's Sparrow;
scale, ½.

A very handsome Sparrow, frequenting brushy places during migration.

554. **White-crowned Sparrow** (Including **Gambel's** or **Intermediate** and **Nuttall's Sparrows**). *Zonotrichia leucophrys.* L, 6·88. Plate LVI A. Adult: back striped in rich seal brown and light grey; below, white. Face, neck, and breast light ash-grey. Crown, black with conspicuous white median stripe. The immature plumage has back striped with brown and brownish-cream and the clear grey of face, neck, and breast replaced with dull ashy; the crown is rusty-brown with a lighter median centre.

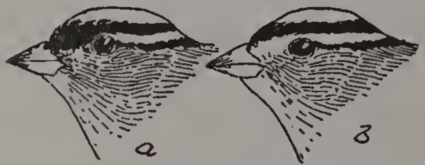
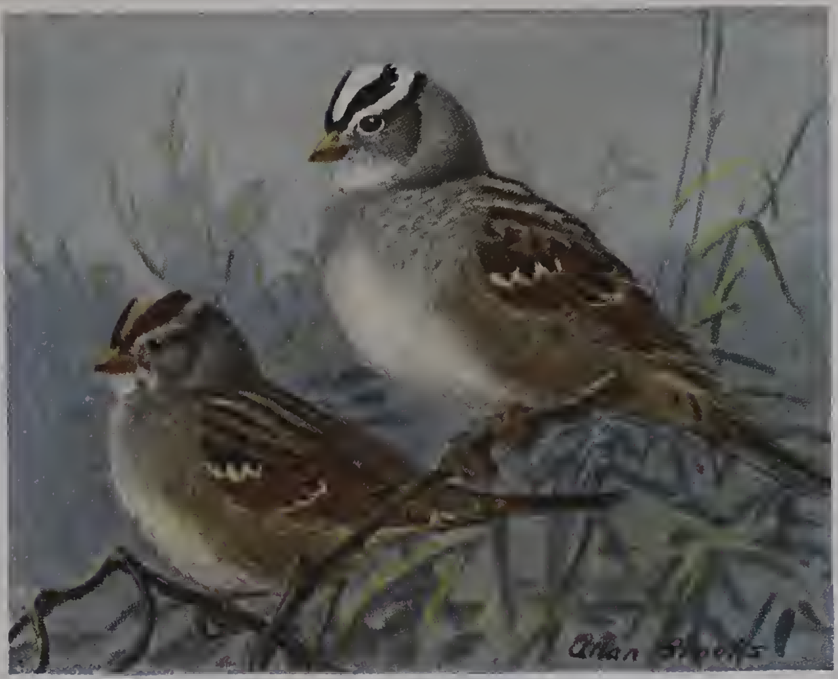


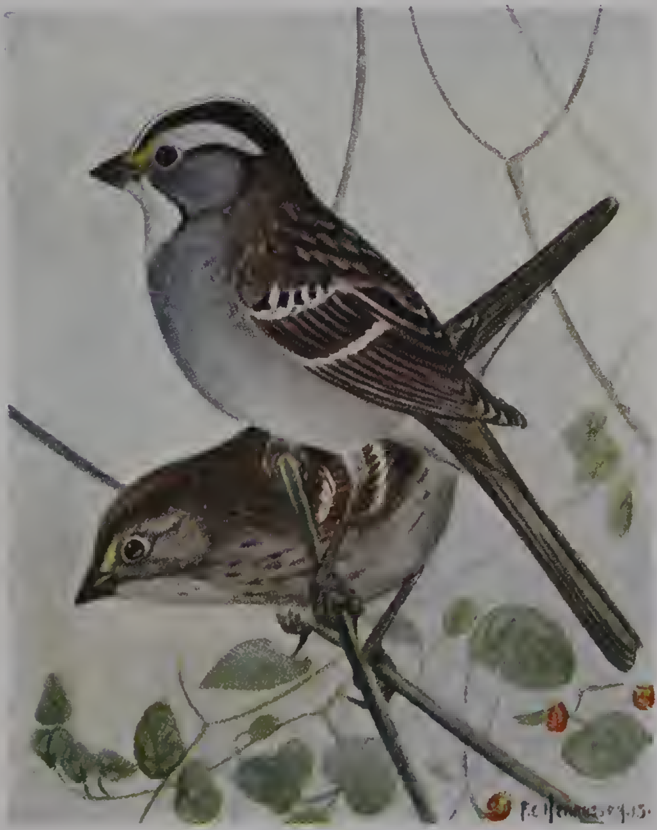
Figure 270
Subspecies of White-crowned Sparrow.
a, Eastern White-crowned;
b, Gambel's Sparrow.

Distinctions. Only to be mistaken for the Golden-crowned and White-throated Sparrows. Brighter coloured than the first, with white instead of golden yellow median stripe, and without the white throat and yellow loral spot of the second. Juveniles are difficult to separate from the Golden-crowned, but the latter almost always have some suggestion of yellow on the crown and are duller and darker in general tone.

PLATE LVI



A. White-crowned Sparrow; scale, $\frac{1}{3}$
(Gambel's Sparrow)
Juvenile Adult



B. White-throated Sparrow; scale, $\frac{1}{3}$
Adult
Juvenile

Field Marks. Brilliant black and white crown and without white throat or yellow loral mark, separates adults from mature White-throats. In juvenility, when the loral spot cannot be seen, the latter has a distinctly red, rather than grey, cast on the back. Distinguished from the Golden-crowned by the white instead of yellow median line. Juveniles are probably difficult to distinguish in life from that species, but the crown shows distinctly reddish instead of yellowish or flat olive.

Nesting. On the ground or in low bushes. Nest of grasses and fine vegetable fibres.

Distribution. North America from tree limits southward. Throughout Canada as a breeder or migrant.

SUBSPECIES. Three subspecies are recognized in Canada. The Eastern White-crown *Zonotrichia leucophrys leucophrys* extends westward over the prairies to the Rocky mountains. It is notable that, although this form in the east breeds only in high latitudes, it is the nesting form of the hills of southwestern Saskatchewan. Gambel's or the Intermediate Sparrow *Zonotrichia leucophrys gambeli* occupies the northern prairies, and the interior of British Columbia, northward into Alaska. It is distinguished from *leucophrys* mainly by the lores being white instead of black (Figure 270, compare a with b). On the coast of British Columbia is Nuttall's Sparrow *Zonotrichia leucophrys nuttalli.* This is like Gambel's, but the grey of the back is slightly olivaceous, the stripes are less reddish and a darker and richer brown, and there is a trace of pale yellow on the edge of the first wing-joint. Gambel's Sparrow occurs in migration throughout the southern prairies, the mountains, and along the coast. The eastern form has occurred at least once in the interior of British Columbia.

One of the most beautiful of the Sparrows. Though it lacks gaudy colours, its sharply contrasting black and white crown and grey throat and neck give it distinction. Its song too, is sweet, but it is usually heard at its best only on its breeding grounds.

Ordinarily it is a great weed-seed destroyer, but when it occurs in immense flocks, as in some parts of British Columbia, some complaints have been made that it eats off the shoots of sprouting garden seeds or even scratches up the seeds themselves. This objection, however, is more or less local.

557. **Golden-crowned Sparrow.** *Zonotrichia coronata.* L, 7. Slightly larger than the White-crowned Sparrow; like it in coloration, but the white median crown-patch is replaced by bright lemon-yellow, and the general coloration is duller, more ochraceous; the clear grey of neck and breast is more brownish ash and it has not the black line back from the eye (Figure 271). The juvenile is similar to the juvenile White-crowned, but the crown-spot is not as clear reddish and is usually tinged with yellow in the centre.

Distinction. The yellow crown in adult and traces of it in juvenility, otherwise a slightly larger and duller-coloured bird than the White-crowned.

Field Marks. Like a White-crowned Sparrow, with no distinct white superciliary line and with golden instead of white crown streak. It may sometimes be impossible to separate juveniles from that species.

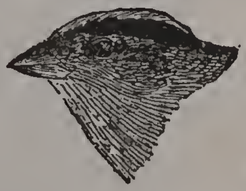


Figure 271
Golden-crowned Sparrow; scale, $\frac{1}{2}$.

Nesting. On the ground; nest of fine grasses and rootlets.

Distribution. Pacific coast region of North America. In Canada, British Columbia and western mountain regions, northward into Alaska and the adjoining foothills in Alberta. Nesting in the mountains south to Jasper Park region and Cariboo district of British Columbia. A regally crowned Sparrow typical of the alpine meadows of the mountains.

558. **White-throated Sparrow.** CANADA-BIRD. CANADA WHITE-THROAT. PEABODY-BIRD. *Zonotrichia albicollis.* L, 6·75. Plate LVI B. Adult: back striped in reddish and dark browns; white below. Face and foreneck light ash-grey with well-defined white throat. Crown, black with conspicuous white median stripe. Superciliary stripe bright yellow in front of eye, changing to white behind. Juvenile has back striped with rufous and brown; dull ashy white below, duskier on breast but whiter on throat. Yellow spot in front of, and over, eye always perceptible.

Distinction. The yellow spot in front of, and over, eye, and distinctly lighter throat are the best distinctive characters.

Field Marks. Distinctions as above. It is the reddest-backed of all the autumn Sparrows.

Nesting. On the ground or in low bushes; nest of coarse grasses, rootlets, and moss, lined with finer grass.

Distribution. Eastern North America. In Canada, west to the mountains and north to the limit of trees. Occasionally in southern British Columbia, breeding in the northern half of that province.

This is the most famous songster of the Canadian north woods. At its best the song is a clear, flute-like, slowly-measured whistle which has been very well put into words. "*Hard-times-can-a-da-can-ada*" or "*Poor-Bill-Pea-bo-dy-Pea-bo-dy-Pea-bo-dy.*" The White-throat is a brushwood bird; tangled thickets or brush piles in the vicinity of open ground are its favourite haunts. Throughout most of the cultivated sections of Canada the bird is a migrant only, and its best song is rarely heard. In the autumn, when the young birds fly south the notes are heard in a softened, shortened version.

Economic Status. The White-throat is a valuable bird. It is important as a destroyer of weed seeds, especially of ragweed, and consumes a considerable number of insects and a little wild fruit. As the species comes down in great numbers to the thickly cultivated sections in early autumn, its effect on the succeeding season's weed crop must be pronounced.

559. **Tree Sparrow** (Including **Western Tree Sparrow**). *Spizella monticola.* L, 6·36. Plate LVII A. About the size of a Song Sparrow, but redder above, a brownish red cap, the breast greyish with a single suffused brown spot in the centre. Bill, upper mandible, dark; lower one mostly yellow.

Distinctions. Size of Song Sparrow; red-brown cap; prominent white wing-bars; ashy-grey throat with semi-concealed dark blot in centre of unspotted breast.

Field Marks. Red-brown cap, prominent white wing-bars, ashy grey throat, and dark spot in middle of the evenly-coloured, unspotted breast.

Nesting. On or near ground, in nest of grasses, rootlets, and hair.

Distribution. Northern North America, breeding in the spruce woods and on the Barren-grounds of the far north. Migrating throughout southern Canada.

SUBSPECIES. The Western Tree Sparrow *Spizella monticola ochracea*, differing from the eastern, *Spizella monticola monticola*, in having slightly longer tail and wing, and somewhat paler coloration. Breeds from Alaska east to Mackenzie valley. Migrants through British Columbia and the western Prairie Provinces are this form, but its distinctions are too slight to be easily recognized and the geographic limits of the two races have not been well defined.

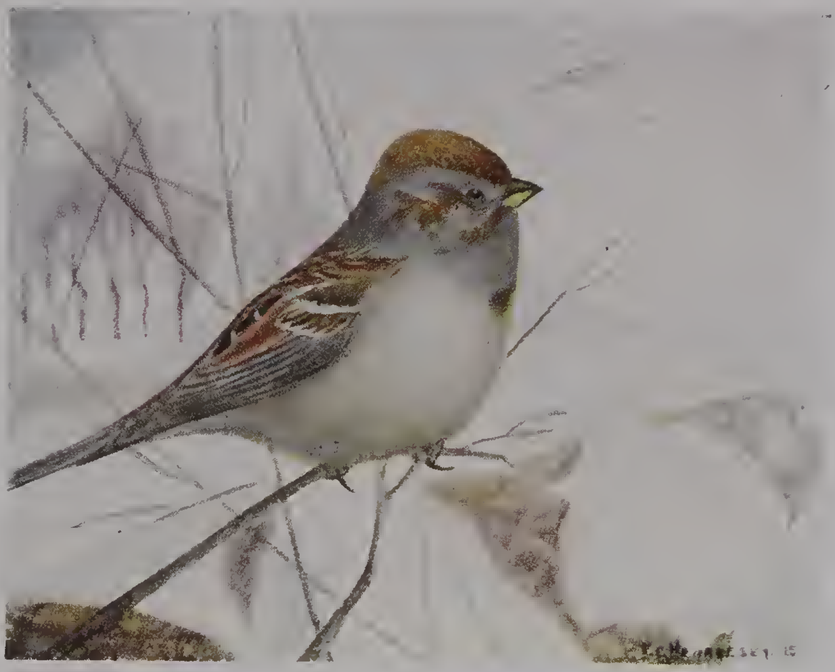
Among the hosts of Sparrows that congregate in the shrubbery in the autumn or return early in spring, is the Tree Sparrow. In the southern parts of the Dominion it sometimes remains all winter, but is a migrant elsewhere. It is a natty little bird and its modest song in the early spring is most welcome after the long, silent winter.

Economic Status. The Tree Sparrow is valuable for its destruction of weed seeds and seems to have no bad habits.

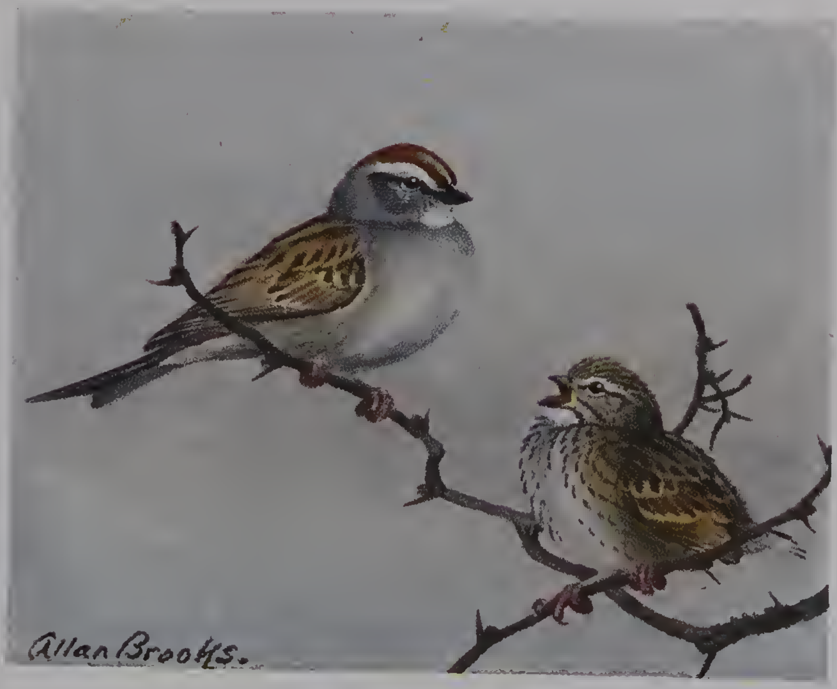
560. **Chipping Sparrow** (Including **Western Chipping Sparrow**). CHIPPIE. HAIR-BIRD. *Spizella passerina.* L, 5·37. Plate LVII B. A small Sparrow with unspotted breast; a red-brown cap; grey face; white superciliary line, and narrow dark bar through eye. Juveniles have a finely streaked white breast and are without the solid red cap or characteristic facial marks; are much streaked above and below in clay-like colours, and are sometimes difficult to separate from Clay-coloured Sparrows.

Distinctions. A familiar little Sparrow with red cap, a grey face, narrow black bar through eye, and white eyebrow streak. Separated from the Swamp and Tree Sparrows,

PLATE LVII



A. Tree Sparrow; scale, 1/3


Allan Brooks.

B. Chipping Sparrow; scale, 1/3
Adult Nestling

which also have red caps, by its much smaller size. Juveniles closely resemble Clay-coloured Sparrows, but the streakings of the breast are more pronounced and numerous, and the breast is not suffused with light buffy. Very juvenile specimens are difficult to separate from that species, and from Brewer's Sparrow, although adults are quite distinct.

Field Marks. Small size. For adults: red cap, grey face with narrow, black eye-bar and white eyebrow line, and spotless light greyish breast. Its song, a long drawn out series of unaccented cheeps, forming a sustained trill, is very characteristic. On the prairies, where the Clay-coloured Sparrow occurs, juveniles may be difficult to separate from that species.

Nesting. In trees or bushes, in nest of grasses, rootlets, and fibres, plentifully intermixed with long hairs. The amount of horsehair used in the nest is the origin of one of this bird's popular names.

Distribution. North America, north throughout the northern spruce woods to Great Bear lake and central Yukon. In Canada, breeding wherever found. Scarce on the open prairies.

SUBSPECIES. The Chipping Sparrow of western Canada, east to western Manitoba, is generally referred to the Western Chipping Sparrow *Spizella passerina arizonae*, characterized from the eastern form by slightly larger average size and paler coloration. The distinction, however, is too fine for general recognition and requires a large series of specimens for its demonstration.

The Chipping Sparrow, except in the open prairie regions, is rarely absent from the vicinity of suburban or village homes, coming close to houses and frequenting the orchard and shade-trees, the front yard, and even the doorstep. It does not fear man, but, though not avoiding him, often it escapes notice through its quiet and unobtrusive habits.

Economic Status. The Chipping Sparrow is a greater insect eater than most of the family. In fact, through June, 93 per cent of its food is composed of insects, only 1 per cent of which are beneficial species, such as predacious beetles and parasitic wasps. The average for the year is 38 per cent of insects, and for the months spent by the bird in Canada, the average must be considerably higher. The vegetable matter consumed consists of small weed seeds in which those of crab-grass, lamb's quarters, and ragweed predominate. A bird having these desirable qualities and coming into the immediate vicinity of the garden is most useful and one to be encouraged in every manner possible.

561. **Clay-coloured Sparrow.** *Spizella pallida.* L, 5·20. Plate LVIII A. A small Sparrow with upperparts streaked in light buff and dark brown to crown, where a whitish median stripe is indicated or suggested. A faint collar of slaty suffusion about back of neck. White below, slightly buffy, on flanks.

Distinctions. Like a Chipping Sparrow in size, but crown sharply streaked like back. No black bar through eye, but a brown one back from it, and conspicuously brownish, dusky ear-coverts. Juvenile birds, lately from nest, are very similar to young Chipping Sparrows of the same age, but the breast is usually suffused with the buffy of flanks and the dark breast streaks are less sharp, fewer, or even absent. The only other species the Clay-coloured is likely to be mistaken for in Canada is Brewer's Sparrow, which see.

Field Marks. An inconspicuous, pale, earthy-coloured little Sparrow like a Chipping Sparrow, but without the strongly characterized face and crown-marks of that species. Instead, the ear-coverts are brownish and are more conspicuous for being lightly lined with darker above and below. It may be best recognized by its song, a low, flat "*buz-buz-buz*" that can be confused with no other bird song on our prairies.

Nesting. On the ground or in low bushes, in nest of grasses lined with hairs.

Distribution. The interior of North America. In Canada, the Prairie Provinces eastward to north of lake Superior, and northward to Great Slave lake, breeding wherever found.

A very typical prairie bird, found wherever a little tangle of rose canes, sage brush, or wolf willow furnishes a suggestion of shelter. It is characterless in colour. Its song, though very distinctive, is flat and insect-like, and were it not a very common and relatively confiding little bird, it would be easily overlooked.

Economic Status. As a weed and insect eater it must rank close to the Chipping Sparrow, which it closely resembles in habit, but no detailed study of its food is at present available.

562. **Brewer's Sparrow.** *Spizella breweri.* L, 5·4. A small Sparrow, of the same general size and appearance as the Clay-coloured (*See* Plate LVIII A), but even more inconspicuously coloured. Evenly streaked in dull ashy and brown all above, and dull white below. Like a faded Clay-coloured Sparrow, without decided cheek patch or suggestion of median crown stripe.

Distinctions. Most likely to be mistaken for the Clay-coloured Sparrow, except as above. The crown is evenly streaked and there is no decided cheek patch. The adult is very like the juvenile Chipping Sparrow but for its general grey coloration, and it lacks the striping of the breast. When in similar striped juvenile condition, the two species probably can only be separated by the expert.

Field Marks. Like a Clay-coloured Sparrow, but paler and duller, with softly blended ashy-brown face, without evident cheek patch. Best recognized by its song, a "*buz-buz-buz*", not as flat as that of the Clay-coloured, but approaching the Chipping Sparrow in quality. This is often immediately followed by a long succession of twittering notes, suggesting the conclusion of the song of the Vesper Sparrow.

Nesting. In low brush; nest of grasses and fine plant fibres.

Distribution. Western North America. In Canada, occurring locally in heavy sage brush land in southern British Columbia, Alberta, and Saskatchewan. Occasionally as far north as Jasper park. This is a very obscure little Sparrow of the sage brush. It is very local and by eyesight alone would often be passed over amongst the many Clay-coloured Sparrows that it associates with in similar situations. It can hardly be overlooked, however, by one familiar with the bird-songs of the sage brush.

566. **White-winged Junco.** *Junco aikeni.* L, 6·25. Like the Slate-coloured Junco, but with white wing-bars.

Distinctions. A large Slate-coloured Junco, with white wing-bars. Not likely to be mistaken for any other species.

Distribution. Central Rocky Mountain region, Wyoming east to the Black hills in South Dakota.

This species has been reported once by Mr. Criddle at Aweme, Manitoba. Can only be a very rare wanderer in Canada.

567. **Junco** (Including **Slate-coloured, Pink-sided, Oregon, Shufeldt's,** and **Montana Junco**). BLACK SNOWBIRD. *Junco hyemalis.* L, 6·27. Plate LVIII B. About the size of a Song Sparrow. Mostly dark or slate-grey; white below, cutting in a straight line sharply across the breast. Or—the same colour distribution, but the head and breast black, and with back and flanks more or less strongly reddish or chestnut; outer tail feathers white. Bill, flesh coloured.

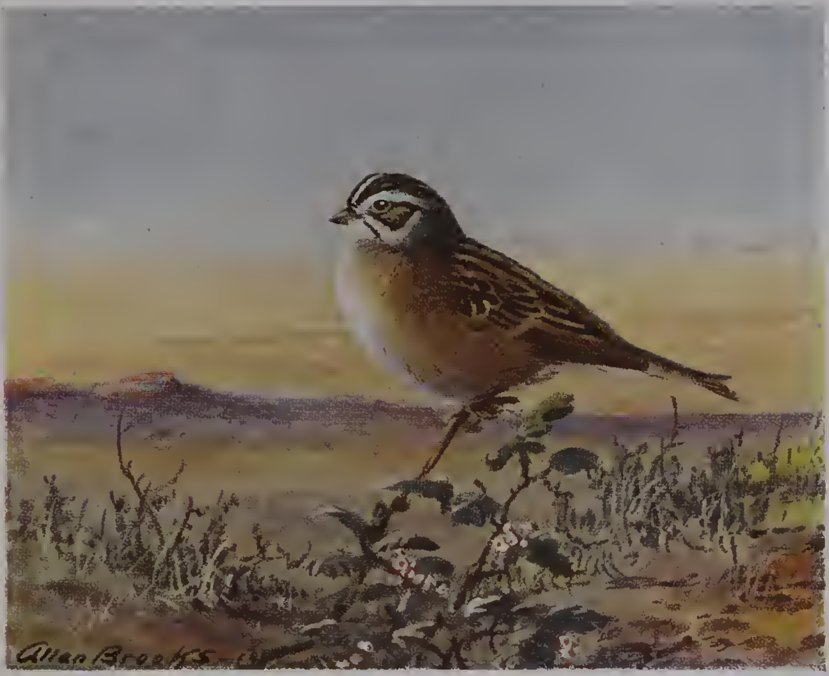
Distinctions. Easily recognized as a Junco by its grey or black head and breast, ending sharply against the white underparts; flesh-coloured bill, and dark tail, with contrasting white outer feathers. Several races intermediate between the red and grey forms are recognizable.

Field Marks. Dark or grey head, and breast sharply defined against white underparts, flesh coloured bill, and contrasting white outer tail feathers, conspicuous in flight. The Vesper Sparrow has somewhat similarly coloured outer tail feathers, but is a buffy appearing bird, instead of a dark grey or reddish one.

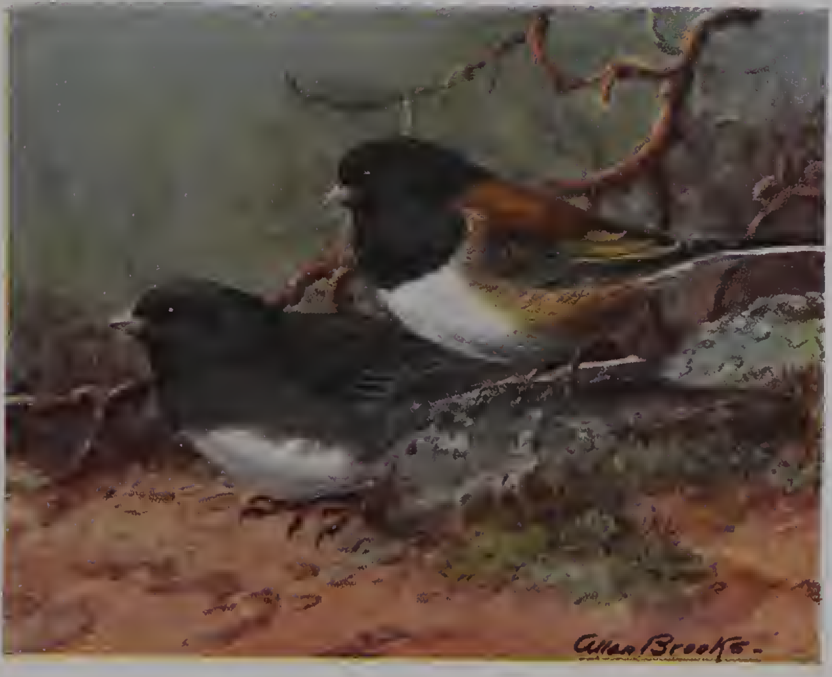
Nesting. On or near the ground. Nest of grasses, moss, and rootlets, lined with finer grasses and long hairs.

Distribution. North America, from tree limits, southward. Breeding throughout Canada, except in the more southern, lower elevations.

SUBSPECIES. A variable species, breaking up into a number of geographical forms. Three distinct types, with several less sharply defined ones, are recognizable in various parts of the country. There is considerable disagreement, even among authorities,



A. Clay-coloured Sparrow; scale, $\frac{1}{3}$



B. Juncos; scale, $\frac{1}{3}$

Slate-coloured Junco Oregon Junco

who have made a study of the species, as to the status and relationship of these forms, but for the sake of uniformity, the nomenclature and classification of the Check-list will be presented here, though it does not exactly reflect the views of the writer.

Taking adult male birds as best showing the distinctive characters, we find the following races in Canada. The Slate-coloured Junco *Junco hyemalis hyemalis*, the eastern representative, extends to the Rocky mountains, and in northern British Columbia, beyond them, in slightly modified form. It is distinguished by its general, uniform dark grey colour, the head almost or quite the same colour as the back and with little or no rusty on back and flanks. In Cypress hills in southwestern Saskatchewan and adjoining parts of Alberta is the Pink-sided Junco *Junco hyemalis mearnsi*, regarded by some authorities as a full species, *Junco mearnsi*. The grey of this bird is considerably paler than in *Junco hyemalis hyemalis*, the flanks are strongly vinaceous-pink, and there is a considerable wash of greyish buff over the back. West of the Coast range in British Columbia is the Oregon Junco *Junco hyemalis oreganus*, also regarded by many authorities as a distinct species, *Junco oreganus*. The head and breast of this bird are black, the back is strongly rusty-chestnut, and the flanks vinaceous-pink. These are three perfectly distinct types, easy of recognition. The following are somewhat more difficult of separation. Shufeldt's Junco occupies the interior of southern British Columbia, between the Coast range and the Rocky mountains. It is called *Junco hyemalis connectens* in the Check-list, but is given various names by other authors. It is like an Oregon Junco with black head and breast, but the reddish on back and flanks is not as strong. Another bird is postulated for western Alberta and southward, the Montana Junco *Junco hyemalis montanus*. This is described as a grey-headed Shufeldt's Junco, with head darker than that of the Pink-sided. Though accredited to Canada, the writer fails to recognize it in the series of specimens in his possession. Instead, he finds a Slate-coloured Junco with a black head and breast, inhabiting the eastern Rockies and extending an indefinite distance eastward, associating closely with Shufeldt's and the Slate-coloured Junco, where its range overlaps with them, but remaining distinct from either. Attention has lately been called to this bird under the name of Cassiar Junco; the scientific name to apply to it is somewhat uncertain, but the name *connectens* has been transferred to it by its describer for nomenclatural reasons. Females and juveniles of all these forms are duller in colour than adult males, those of the red-backed types have less red or pink than corresponding mature males, and those of the others, more. Even characteristic Slate-coloured Juncos may, when juvenile, have traces or distinct washes of rusty on flanks or back. Owing to this sexual and age variation, and to the fact that several forms may mix together in migration, some of these birds are very difficult to identify and our knowledge of their exact distribution or occasional occurrence is very imperfect.

The Junco, with its black breast, light-coloured bill, and white bordered tail, is conspicuous amongst the large flocks of Sparrows passing through or tarrying in the spring and autumn.

Economic Status. The effect of the Junco on agriculture is almost wholly beneficial. During its stay in the more settled sections it consumes large quantities of weed seeds. The insects it takes are mostly harmful. Little or no exception can be taken to it, as it does no perceptible damage to crops or fruit.

When the species occurs in unusual numbers, as occasionally happens in British Columbia during their migration, their partiality for small seeds may sometimes make seeding a little difficult.

581. **Song Sparrow** (Including **Dakota, Rusty, Sooty, Yakutat, Kenai, Bischoff's**, and **Aleutian Song Sparrows**). *Melospiza melodia.* L, 6·30 (on northwest coast to 7·50). Plate LIX A. A medium-sized brown and white streaked Sparrow. Underparts white; breast and flanks heavily and sharply striped with brown; the stripes aggregated to form a dark spot in the centre of the breast.

Distinctions. Rather like the Vesper Sparrow in size and general coloration, but darker and more decided in tone; lacks the white outer tail feathers. The breast-streaks are also sharper and darker brown and aggregated in the middle into a well-defined spot. The lack of the yellow stripe over the eye separates the Song from the Savannah Sparrow and the sharply streaked breast from any of the other Sparrows of comparable size and habit. The Song Sparrows of British Columbia are so much darker in general coloration than those of farther east that it is unlikely that they will be often confused with these species.

Field Marks. Sharply striped breast and central spot. The absence of the white outertail feathers will guard against confusion with the Vesper Sparrow, and longer tail, lack of yellow lores, voice, and general attitude distinguish the Song Sparrow from the Savannah. The song is very distinctive, especially in its opening, which always consists of a single distinct note repeated at least once, and has been humorously interpreted as "*Pres-pres-presbyteri-eri-erian.*" The first part of this rendition is very good. The latter part of the song is too variable to be rendered by any single set of syllables.

Nesting. On the ground, more rarely in bushes, in nest of coarse grasses, rootlets, dead leaves, strips of bark, etc., lined with finer grasses and sometimes long hairs.

Distribution. The Song Sparrow inhabits all America to the tree limits.

SUBSPECIES. The Song Sparrow shows a wonderful adaptability to various conditions. Scarcely any large area in North America but has Song Sparrows that have become specially modified to agree with regional conditions. Some of these specialized forms are well marked and easily recognizable, but others differ so slightly as to tax discrimination to the utmost. The arid deserts of the southwest have their small, pale forms and the humid coast has produced a number of very large, dark ones, culminating in the comparatively gigantic race of the damp Aleutian islands. Especially have a great number of geographical races been produced in the broken country adjoining the west coast of America. In the east, physical and climatic conditions are more uniform and there has been less tendency to subspecific division in the species. West of the Great Lakes to the coast, the American Ornithologists' Union Check-list ascribes four breeding subspecies and a number of more migrant ones. The Eastern Song Sparrow *Melospiza melodia melodia* extends west to eastern Manitoba and probably northward through the wooded regions to northern Alberta and Great Slave lake. The Dakota Song Sparrow *Melospiza melodia juddi* is the form of southern Manitoba, Saskatchewan, and Alberta. It is barely distinguishable from the Eastern Song Sparrow, though averaging slightly lighter, with clearer and sharper markings. According to the latest study of the species most of British Columbia is occupied by the Rusty Song Sparrow *Melospiza melodia morphna.* This is the first of a series of Song Sparrows strikingly different from the two light eastern races. They are very dark and saturated in colour, enough so that if they did not intergrade through various southern races, they might well be regarded as a well-defined species. Of these dark races, *morphna* averages ruddy in the brown tones, especially on the back. The Sooty Song Sparrow *Melospiza melodia rufina* occupies the islands of the Alaska Panhandle including the Queen Charlotte islands within Canadian territory. It is a large-appearing bird, with the browns sooty instead of ruddy.

Along the coast of Alaska, eastward to the point of the Aleutian Islands chain, a number of forms are distributed. These, reading westward, are: the Yakutat Song Sparrow *Melospiza melodia caurina*; The Kenai Song Sparrow *Melospiza melodia kenaiensis*; Bischoff's Song Sparrow *Melospiza melodia insignis*, and the Aleutian Song Sparrow *Melospiza melodia sanaka.* These have the browns of the back generally greyer than the preceding races, and are separated from each other by small distinctions. They progressively increase in size until, in the Aleutian Song Sparrow, we find a bird comparatively huge for a Song Sparrow, that approaches the Fox Sparrow in measurement. Some of these may be expected along the British Columbia coast in migration, but, though extremes are marked, the distinctions between adjoining races are too slight to be briefly defined here or to be recognized without an ample series for comparison.

It is difficult to form a just and unprejudiced estimate of the standing of the Song Sparrow in the avian chorus. Its little medley of chirps and trills makes a sustained song of some duration and to those who listen to it sympathetically it has a gladness, brightness, and sweetness of tone that are difficult to surpass. The bird is almost omnipresent. It lives in the shrubbery close about the house and is one of the familiar birds of the garden. It haunts the thickets on the edge of the wood-lot or bordering rivulets. The deep woods and the clean, open fields are the only places where it is generally absent, and even there it sometimes surprises us with a burst of liquid song.

Economic Status. The great numbers of the Song Sparrow render it most important to the agriculturist. An analysis of its food shows that only 2 per cent is composed of useful insects and 18 per cent of harmful ones. Waste grain constitutes 4 per cent and weed seeds 50 per cent.

The remainder is composed of wild fruit and other unimportant material. It is seen from this that the Song Sparrow is of considerable economic importance. Investigation has shown that one-quarter of an ounce of weed seed a day is a fair estimate of the amount consumed by a seed-eating Sparrow. During the nine months the Song Sparrow is with us in the average Canadian locality the consumption amounts to four and a quarter pounds an individual a year. Allowing seventy-five Song Sparrows a square mile as a very conservative estimate of population, we get a total for the southern cultivated parts of Ontario of over eleven thousand tons of weed seeds destroyed annually by this one species; other sections are probably in proportion.

583. **Lincoln's Sparrow** (Including **Forbush's Sparrow**). *Melospiza lincolni.* L, 5·75. Like the Song Sparrow but with a belt of buffy across the breast which is marked also with small, fine spots not aggregated into a central blotch.

Distinctions. The above distinctions will separate Lincoln's from all other Sparrows it may be confused with.

Field Marks. A good view will show the faint buff breast and fine spotting. Otherwise it is with difficulty separated in life from the Song Sparrow. The back is rather greyer than the Song Sparrow and this often arouses a suspicion of the presence of Lincoln's Sparrow that may be confirmed by other characters.

Nesting. Similar to that of the Song Sparrow, on the ground.

Distribution. The species is distributed all over America, breeding in the northern coniferous woods.

SUBSPECIES. The Eastern Lincoln's Sparrow *Melospiza lincolni lincolni* extends west to the Coast range. Forbush's Sparrow *Melospiza lincolni striata* is accredited to the coast, breeding south to Sitka region, Alaska, and migrating along the British Columbia coast. It is a faintly defined race, slightly more olivaceous on back, and with the dark streaks heavier and more numerous. It is not unanimously accepted and the difficulty of identifying individual specimens makes the separation of range of the two forms very uncertain.

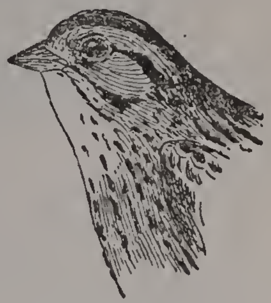


Figure 272
Lincoln's Sparrow; scale, ½.

On migration, especially in the east, Lincoln's is one of the shyest and most elusive of birds. It skulks in the brush and has reduced concealment to a fine art. On its breeding grounds and in the west it is much more confiding, and, especially when in song, it is not very difficult to find.

584. **Swamp Sparrow.** *Melospiza georgiana.* L, 5·89. Much like the Song Sparrow, but of stronger and less blended coloration and without any distinct breast-streaks or markings.

Distinctions. The Swamp Sparrow is difficult to separate from several other forms comparable in both colour and size. It may be distinguished from the Song Sparrow, with which it is most likely to be confused by the unstreaked breast, and, in adult birds, by the red crown. Young autumn birds strongly resemble juvenile White-throats, but lack the faint yellow loral spot, are not as evenly ruddy on the back, and usually have a suggestion of an ashy bar across the shoulders at the base of the neck, an ashy cast to the crown, and eyebrow lines that are absent in that species It may be known from the Tree Sparrow by the lack of the dark middle breast-spot or white wing-bars.

Field Marks. It resembles a Song Sparrow without breast-streaks, a White-throat without yellow loral spot, or a Tree Sparrow without wing-bars or breast-spot. In summer when the Tree Sparrow is not present, the red cap is distinctive.

Nesting. Nest similar to that of the Song Sparrow, on the ground, sometimes in the grass.

Distribution. North America, mostly north and east of the Great Plains. Rare or absent in migration in the prairie regions. One record for central British Columbia.

As its name implies, this is a bird of the swamps and marshes. The long grass and shrubby edges of marshes are its typical haunts. Late in the autumn it joins the large mixed flocks of Sparrows in the brush heaps and tangled fence-rows and then comes into closer contact with man.

Economic Status. The food habits of the Swamp Sparrow are not very different from those of other comparable Sparrows. Owing to its living in waste places the species is not important.

585. **Fox Sparrow** (Including **Slate-coloured, Shumagin, Townsend's,** and **Sooty Fox Sparrows**). *Passerella iliaca.* L, 7·26. A rather large, reddish Sparrow, exhibiting, according to geographical range, three distinct types of coloration. West to the Rocky mountains (the *iliaca* type): above, bright reddish brown, solid on tail and rump, but broadly striped on dull slaty back, hindneck, and crown: below, white, heavily spotted and streaked with red, like the back, on sides of throat, across breast, and on flanks. The centre of throat is almost free from markings and the spots tend to aggregate on the breast in a centre spot. West of the mountains, except the coast, we have a rich brown and grey bird (the *schistacea* type), like the last except that the reds are darkened to chocolate brown and there is little striping on the grey, which also suffuses largely over face. On the coast (the *unalaschcensis* type), the brown still deeper and richer, nearly or quite supplanting the grey, and the stripes below much more extensive, broader, and more coalescent.

Distinctions. Large size for a Sparrow. East of the mountains, large amount of foxy red, solid on the tail and rump, heavily streaking the breast and flanks. In the interior of British Columbia, face, head, shoulders, and back, mostly grey; chocolate-brown wings, tail, and stripes on breast and flanks. The west coast type, a solidly dark, maroon-brown bird, the colour only broken by more or less coalescent white flecks on foreneck and abdomen.

Field Marks. A large Sparrow with much foxy red; dull grey head and back, brown tail and breast-streaks; or solid dark brown with white flecks on throat and below.

Nesting. On the ground, or in low trees or bushes. Nest of coarse grasses lined with finer grass, hair, moss, and feathers.

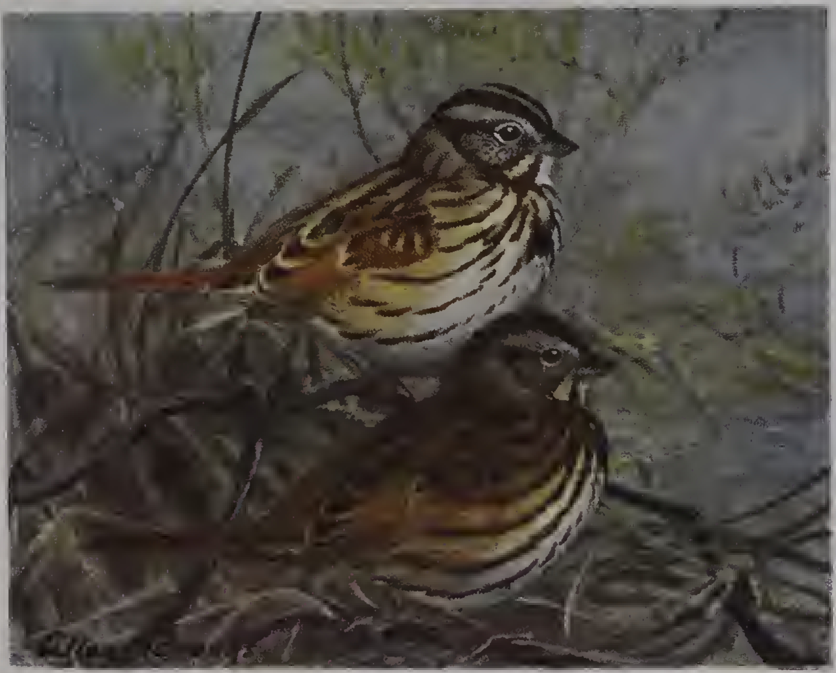
Distribution. Northern and western North America, breeding far to the north of ordinary cultivation.

SUBSPECIES. A remarkably variable species, breaking up into a number of extraordinarily distinct subspecies. Indeed, some doubt may well be expressed as to whether some of the differences are not fully specific. The Eastern Fox Sparrow *Passerella iliaca iliaca* extends west to the mountains and northwest throughout the interior of Alaska. It is a distinctly foxy-red bird, as suggested by the vernacular name of the species. This form stands apart from all the rest in coloration, and shows, at least within our borders, no tendency to intergrade with the next following subspecies that occupies the interior of central and southern British Columbia and the foothills of Alberta. The Slate-coloured Fox Sparrow *Passerella iliaca schistacea* has grey predominating on face and back, and the reds darkened to brown. This bird extends south to Nevada, though some Canadian representatives are sometimes differentiated from it under the name of *Passerella iliaca altivagans.* On the British Columbia and Alaskan coast, we get a series of subspecies of the *unalaschcensis* type, solidly maroon and brown birds with little white below. These are heavily feathered birds, that appear larger than their measurements seem to warrant. Four subspecies are recognized in the Check-list, more by other authorities. Beginning with the Shumagin Fox Sparrow *Passerella iliaca unalaschcensis*, of the Alaska peninsula; the Kadiak Fox Sparrow *Passerella iliaca insularis* is next along the coast, extending eastward to the base of the Alaska Panhandle. Townsend's Fox Sparrow *Passerella iliaca townsendi* occupies the Panhandle itself, and the northern British Columbia coast; and the Sooty Fox Sparrow *Passerella iliaca fuliginosa,* Vancouver island and closely adjoining Washington coast. They vary from each other slightly in colour and size details, but are too much alike to be satisfactorily separated without a large series of specimens for comparison. Any of these forms may be expected on the British Columbia coast in migration. The Vancouver Island bird, the Sooty Fox Sparrow, is the only one permanently resident in its breeding locality and is the darkest and most saturated in colour of the series.

This Sparrow remains within the limits of civilization only for a few days in spring and autumn. Occasionally in spring it greets us with a song of full clear tone that is equalled by few other birds and rarely surpassed by any.

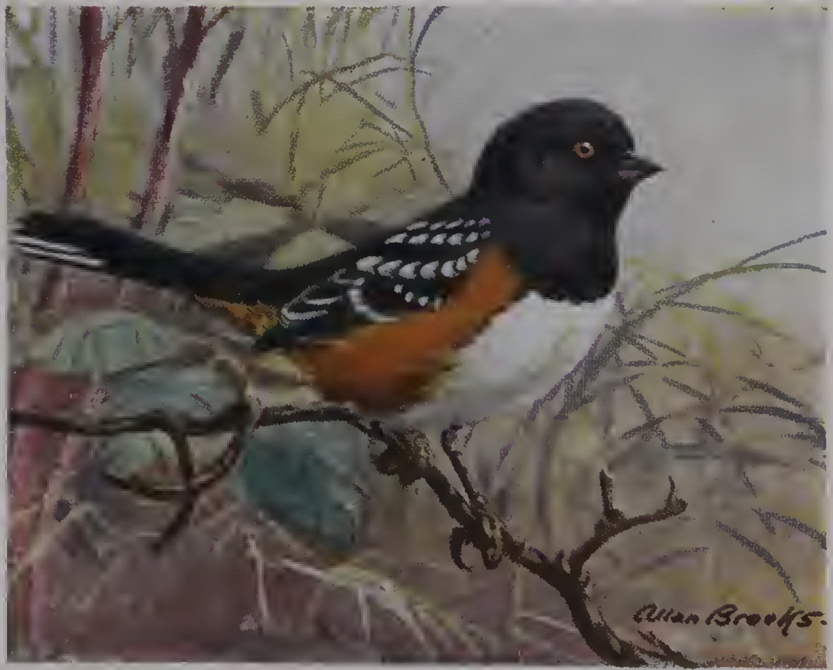
Economic Status. It is with us barely long enough or in sufficient numbers to be of great importance to the agriculturist. It eats a little

PLATE LIX



A. Song Sparrow; scale, $\frac{1}{3}$

Dakota Song Sparrow Rusty Song Sparrow


Allan Brooks.

B. Spotted Towhee; scale, $\frac{1}{3}$

(Spurred Towhee)

more fruit than the majority of the Sparrows, but at the seasons of its visits to agricultural sections little cultivated fruit is available, and the insect and weed-seed parts of its food are such that it need seldom cause anxiety.

587. **Eastern Towhee.** GROUND ROBIN. CHEWINK. *Pipilo erythrophthalmus.* L, 8·35. Male; almost exactly like the male Spotted Towhee (Plate LIX B), but without the white spotting on the wing-coverts and scapulars; the outer vanes of the primaries, near the base, are white, making a white spot on the closed wing. The female is like the male, but has the black replaced with rusty wood-brown.

Distinctions. Requiring separation only from the Spotted Towhee as above.

Field Marks. A mere glimpse of the black or brown head and back, red flanks, and white underparts cutting in a sharp band across the breast, is sufficient whereby to recognize the Towhee. As it dashes away into the underbrush, the flash of black and white in the male, or the brown and white in the female, is unmistakable. The rich brown of the female and the lack of small spotting on the shoulders and wings will separate from the Spotted Towhee in the few areas where the two species may occasionally overlap in range.

Nesting. On or near the ground, in nest of dead leaves and strips of bark, lined with fine grasses.

Distribution. Eastern North America. In Canada, the more southern parts west to include southern Manitoba.

SUBSPECIES. The only subspecies represented in Canada is the Eastern Towhee or Chewink *Pipilo erythrophthalmus erythrophthalmus.*

The Towhee is a bird of brushy wastes or wood-edges, where its distinctive note "*Chewee*" or "*To-wee*" is a familiar sound. It delights to perch on the top of a sapling standing alone in the underbrush and sing its clear "*Dick-yoo, chiddle-chiddle-chiddle*". On being disturbed it drops straight down into the underbrush, its black and white uniform flashing an instant, then vanishes in the tangle, whence it peers about uttering its usual "*Che-wee*" in inquisitive accents. In feeding it scratches over the surface like a hen, making the dead leaves fly in all directions.

588. **Spotted Towhee** (Including **Arctic, Spurred,** and **Oregon Towhees).** *Pipilo maculatus.* L, 8·35. Plate LIX B. Male: jet black above, including head, neck, and upper breast, cutting sharply across chest against pure white underparts. A broad bar of reddish-brown or bay along flanks. Wing-coverts and outer scapulars conspicuously spotted with white. Female similar, but the black greyish.

Distinctions. Only to be confused with the preceding Eastern Towhee, but easily distinguished by the liberal white spotting of the wing-coverts and scapulars. The back, head, and upper breast of the female are greyish black instead of light wood-brown, as in that species.

Field Marks. The large amount of contrasting black and white, and the reddish flanks are enough to identify this species at a glance. The amount of spotting on the wings and the grey-black, instead of wood-brown, of the female will separate it from the Eastern Towhee in the few localities where their ranges may occasionally overlap.

Nesting. On or near the ground in brush; nest of dead leaves and strips of bark, lined with fine grasses.

Distribution. Western North America. In Canada, from central south Saskatchewan westward through southern British Columbia to the coast.

SUBSPECIES. The Towhee of the prairie regions is the Arctic Towhee *Pipilo maculatus arcticus.* That of the interior of British Columbia, the Spurred Towhee *Pipilo maculatus montanus* (shown in Plate LIX B), is very slightly different from it. On the coast, however, the Oregon Towhee *Pipilo maculatus oregonus* shows quite distinct characters, the white spotting of the wings and back is very much less, and the red of the flanks is deeper and richer in colour.

Like the Eastern Towhee, the Spotted is a bird of the brush and almost identical with it in general habits. To those familiar with the former, the latter presents nothing strikingly new. The notes are similar enough to be recognized as a Towhee's, but with a sufficiently different tone and accent to attract attention. On the whole, the Spotted Towhee's voice is hoarser, and its song less clearly musical than that of its eastern relative.

Economic Status. Probably not different from that of the Eastern Towhee.

595. **Rose-breasted Grosbeak.** *Hedymeles ludovicianus.* L, 8·12. Plate LX A. Spring male: tail, wings, back, head, and neck black, with conspicuous white patches on wings, rump, and tail; breast rose-red; below pure white. The female is an altogether different looking bird, with its typical sparrow-like striping above; in dull olive-brown and pale ochres; below, white, sharply striped on breast and flanks. Autumn males are similar to the female, but warmer in general colour and with an undercolouring of rose on breast. In any plumage with large, light-coloured bill (Figure 259).

Distinctions. The spring male, with black back and head, flashing white-spotted wings and tail, and brilliant red bib, is unmistakable. The female resembles a Purple Finch in the olive plumage, but is obviously larger, much more contrastive in colour, and the underparts are purer white. Still more likely to be confused with the female of the Black-headed Grosbeak in the few regions where both species may occur. They resemble each other in nearly every detail of colour distribution and size, but the female Rose-breasted is decidedly duller in general tone and the breast is whiter and more obviously streaked (Compare with Plate LX B). Juvenile and autumn males can always be recognized by having rose underwing-coverts.

Field Marks. The flashing black and white of the male with its conspicuous rose-coloured bib is always easily recognized. The female may be mistaken for the female Purple Finch, except for its larger size, whiter or more buffy underparts, with sparser stripings, white wing-bars, and especially, its much more distinct light line over the eye. It is doubtful if it can always be satisfactorily known from the female Black-headed Grosbeak in life.

Nesting. In bushes or trees, 5 to 20 feet from ground, in poorly-built nests of fine twigs, weed stalks, and rootlets.

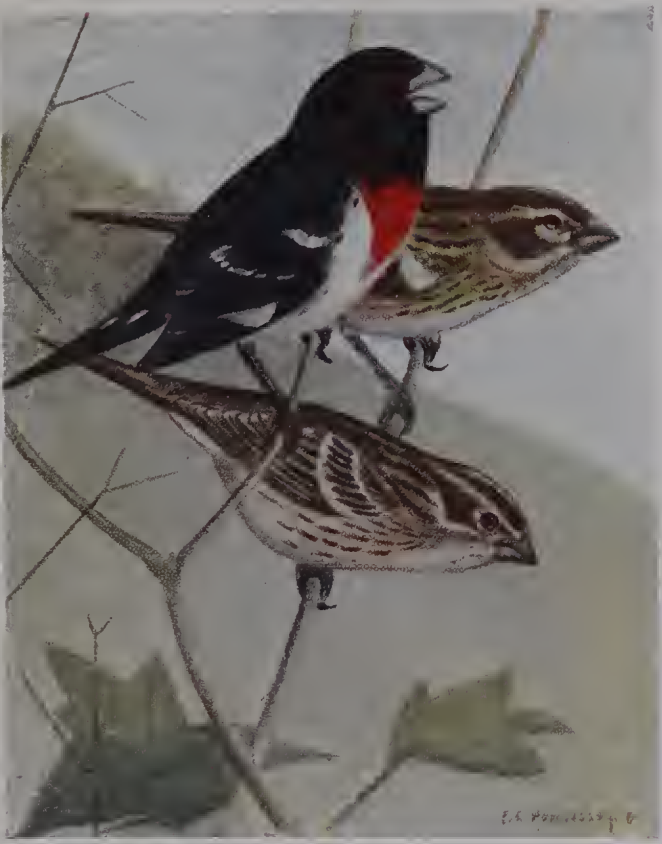
Distribution. Eastern North America. In Canada, west to the base of the mountains and north to Athabaska lake.

The Rose-breasted Grosbeak is one of our most beautiful birds, and with a very pleasing song much like that of a Robin. In the autumn its most frequent note is a curt, metallic "*klip*" that will often attract attention when it is hiding in dense foliage. It prefers tangled thickets and large trees, interspersed with open spaces. It frequents thickets along rivers, edges of woodland clearings, and sometimes orchards.

Economic Status. If the number of Rose-breasted Grosbeaks could be greatly increased on the farms the potato-bug scourge would soon disappear. This bird is one of the few that eats potato-beetles and it takes them in both adult and larval stages. One-tenth of the contents of the stomachs examined consisted of potato-bugs, and against other insect pests this species is even more effective. To increase the numbers of Rose-breasted Grosbeaks may be difficult, but the next best thing is to conserve what we have, protect them from preventable destruction, and see that suitable nesting corners are left in waste corners of the farm and woodlot. In carrying out plans for clean cultivation and the elimination of waste places, care should be taken that bits of shrubbery are left to afford shelter for birds which without these sanctuaries must disappear. The preservation of the birds will more than compensate for the small losses entailed.

596. **Black-headed Grosbeak.** *Hedymeles melanocephalus.* L, 8·10. Plate LX B. Male: head, face, wings, and tail, with a broken saddle across shoulders, black. Conspicuous white patches on wing and in tail. Throat, breast, flanks, a ring about base of neck, streaks in black saddle, and rump are tawny buff, brightening in centre of abdomen to lemon-yellow. Female: striped above with brownish black, ochre, and white; white

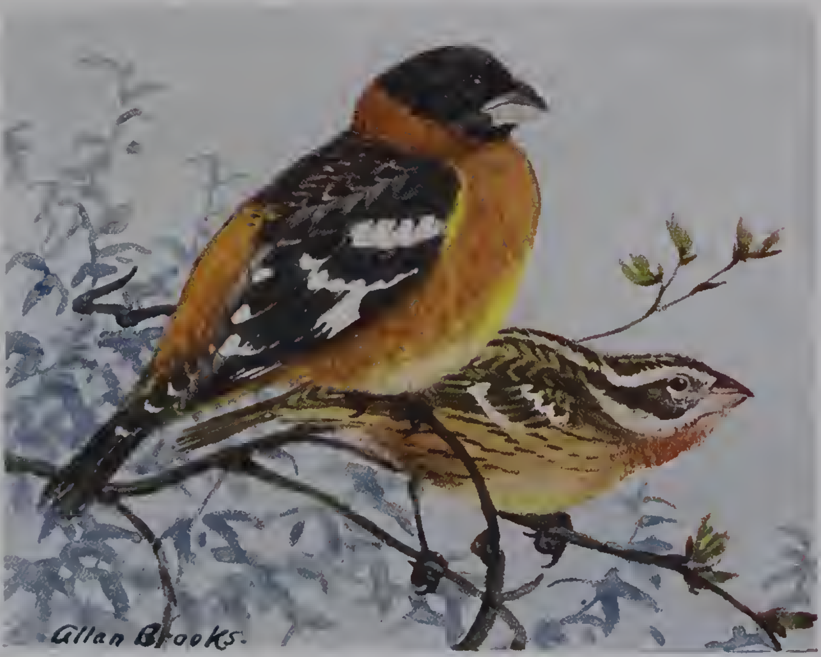
PLATE LX



A. Rose-breasted Grosbeak; scale, $\frac{1}{4}$

Spring male Autumn male

Spring female



B. Black-headed Grosbeak; scale, $\frac{1}{3}$

Male Female

below; pale ochre suffusion across breast and sharply striped along flanks. Like the female Rose-breasted Grosbeak, but stronger in colour and more decided in pattern (compare with Plate LX A).

Distinctions. The black head, large areas of solid tawny buff of breast and around base of neck are perfectly distinctive for the male. The female is very much like the female Rose-breasted Grosbeak, but the colours are much stronger and contrastive, the breast is more ochraceous, and the stripings below are sparser, sharper, and confined more closely to the flanks. The dark of the head deepens to nearly black instead of only to a dark olive-brown. The markings and colours are much too decided to be confused with those of the Purple Finch, even if size of the bird were not a sufficient distinction.

Field Marks. Black head, wings, and tail, both the latter with contrastive patches of white, and the uniform buffy ochre of breast and flanks for the male. For the female, large size, general striped appearance, and the conspicuous white line over the eye. Almost black cheek and crown. Probably it cannot be separated readily from the female Rose-breasted Grosbeak in life.

Nesting. In bushes or trees, in nest of fine twigs, weed stalks, and rootlets.

Distribution. Western North America. In Canada, the southern parts of the western provinces, east to western Saskatchewan.

The Black-headed Grosbeak is a frequenter of deciduous growth and thickets, especially near water. It is a charming songster like the Rose-breasted Grosbeak, and resembles it in most of its habits.

Economic Status. The Black-headed Grosbeak has been accused of damaging fruit, and, in California, a very complete investigation was made of its food habits. The findings substantiate some of the charges, but also prove that from April to September its insect food amounts to practically three times the bulk of the vegetable supplies that it takes. These insects include many of the worst pests, codling moths, cankerworms, and several kinds of scales. As much of the vegetable food consists of weed seeds and wild fruits, except in very exceptional cases, it seems that any fruit it may take is small pay for the good it does.

598. **Indigo Bunting.** INDIGO-BIRD. *Passerina cyanea.* L, 5·59. Rather small, about the size of a Chipping or a Clay-coloured Sparrow. Male: brilliant blue all over, darkening on head. Female: dingy brown, rather whitish with indistinct stripes below and somewhat rusty above. Faint suggestions of blue on outer webs of wing and tail feathers. Autumn adults are between these two. Juveniles are softly striped below and decidedly washed with rusty above.

Distinctions. The male Indigo Bunting and the Mountain Bluebird are the only all-blue birds to be met with in Canada. The two are too far separated geographically, however, often to require special distinction. The Bunting is much smaller, has a typical Sparrow bill, and darkens instead of lightens towards the head. The female and juvenile are too dissimilar to be confused with the Bluebird, but are like the similarly sized Lazuli Bunting.

Field Marks. Small size and all-blue coloration of male, and the even, unstreaked dull or rusty coloration of the female and juvenile.

Nesting. Generally in the crotch of a bush; nest of grasses, dead leaves, and strips of bark, lined with fine grasses, rootlets, and long hairs.

Distribution. Eastern North America. In Canada, west to southern Manitoba. One record for southwestern Saskatchewan.

The Indigo Bunting commonly frequents brushy, overgrown wastes, burnt land, or slashes. It has a pleasing song.

Economic Status. Our knowledge of the food of the Indigo Bunting is not complete. There is little doubt that it has the usual food habits of its family; in the east it is credited with doing good work against the browntailed moth.

599. **Lazuli Bunting.** *Passerina amoena.* L, 5·50. Plate LXI A. A small Sparrow, about the size of the Chipping or Clay-coloured Sparrow. Male: of striking bright blue, ruddy buff, and white. Female and juvenile: even, dull, rusty-olive above, slightly bluing on rump; white below, with soft, warm, tawny suffusion across breast.

Distinctions. The male, with its strongly contrasted brilliant coloration, is unmistakable. The female and juvenile are recognizable by their evident sparrow-like bill, dull even coloration, and usually the soft suggestion of blue on rump and the outer webs of tail and wing feathers. The only practically unstreaked, small, dull, earth-coloured Sparrow. Likely to be confused only with the Indigo Bunting, but so far separated in range from it as seldom to require comparison.

Field Marks. The adult male is unmistakable. The juvenile and female are recognized by small size and soft, even, earthy or slightly ruddy coloration.

Nesting. Generally in bushes. Nest of grasses, dead leaves, and strips of bark, lined with fine grasses, rootlets, and long hair.

Distribution. Western North America. In Canada; southern British Columbia and adjoining parts of Alberta, north to Jasper park. Occasional records for southern Saskatchewan and Great Slave lake.

The male is a veritable living jewel, that flashes in the sun. The female, as is the case with many bright species, is duller coloured. It is a bird of brushy wastes, and sings a sustained little warble that is very pleasing. In general habits and song, quite similar to the Indigo Bunting of the east.

604. **Dickcissel.** LITTLE MEADOWLARK. *Spiza americana.* L, 6. About the size of a House Sparrow. Male: back striped with dark brown and dull red, changing to solid dull red on wing-coverts; hindneck, slate-grey to crown, where it is strongly tinged with yellow; cheeks, grey, with pure yellow eyebrow line. Below, white; breast pure yellow with a sharply defined black throat patch or bib. The female has a very close general resemblance to a female House Sparrow, but is paler, has sharper back streaks, and usually a suggestion of yellow in centre of breast and over eye.

Distinctions. The Dickcissel, with its yellow breast and black bib, slightly suggestive of the much larger Meadowlark, is very distinctive. The female might be mistaken for the female Bobolink, but is much less sharply marked and without any general ochre coloration. Differs from the female House Sparrow in its paler coloration, and suggestion of lemon-yellow on centre of breast and over eye.

Field Marks. A medium-sized Sparrow, with yellow breast and black bib. Female is much too grey to be often confused, even in life, with the Bobolink, but, unless its associate male is present, the voice recognized, or the yellow on the breast visible, it may be difficult to separate it from the House Sparrow. The song of the male is very distinctive, the notes being a loud, clear *"Chup-chup-klip-klip-klip."*

Nesting. On the ground, or in low bushes. Bulky nest of coarse grass and leaves, lined with finer grasses and hairs.

Distribution. Eastern North America. In western Canada, noted only occasionally from southern Manitoba and in single occurrences for southern Saskatchewan and Okanagan valley, British Columbia. A frequenter of open fields or shrubby wastes, and is very rare in Canada.

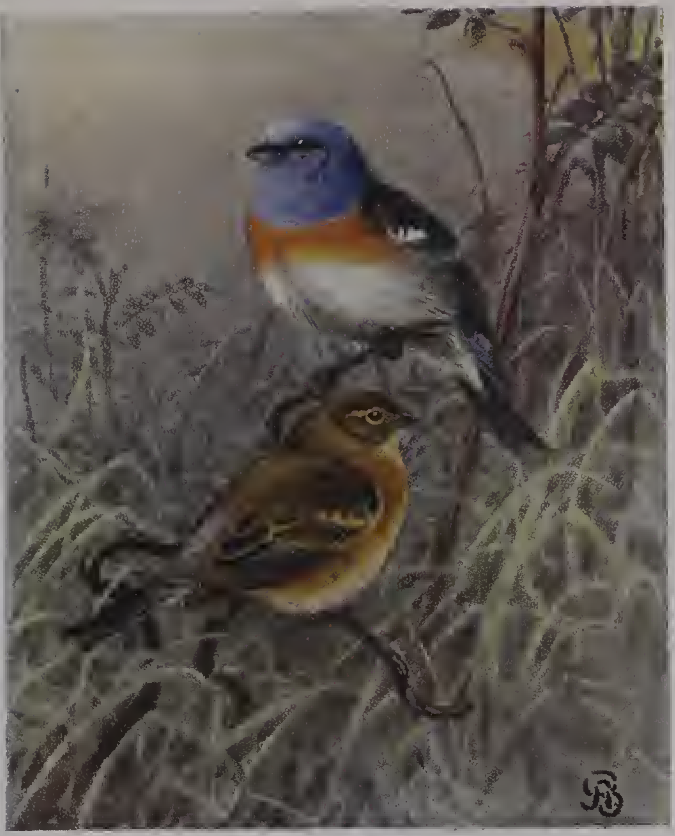
605. **Lark Bunting.** *Calamospiza melanocorys.* L, 7·2. Plate LXI B. About the size of a House Sparrow. The spring male is a very conspicuous bird, solid black, with a large white patch on the wings. The female, and male in autumn, and the juvenile are dull-coloured birds, striped above in light, dull, earthy browns; below, white, sharply striped on breast and flanks.

Distinctions. The spring male, black and with conspicuous white wing patches, is unmistakable. Other plumages resemble that of the female House Sparrow, except for the stripes on breast, or those of dull-coloured Purple Finches, but are earthy in tone rather than olive. From all comparable species they may be known by the white, in young birds cream, upperwing-coverts.

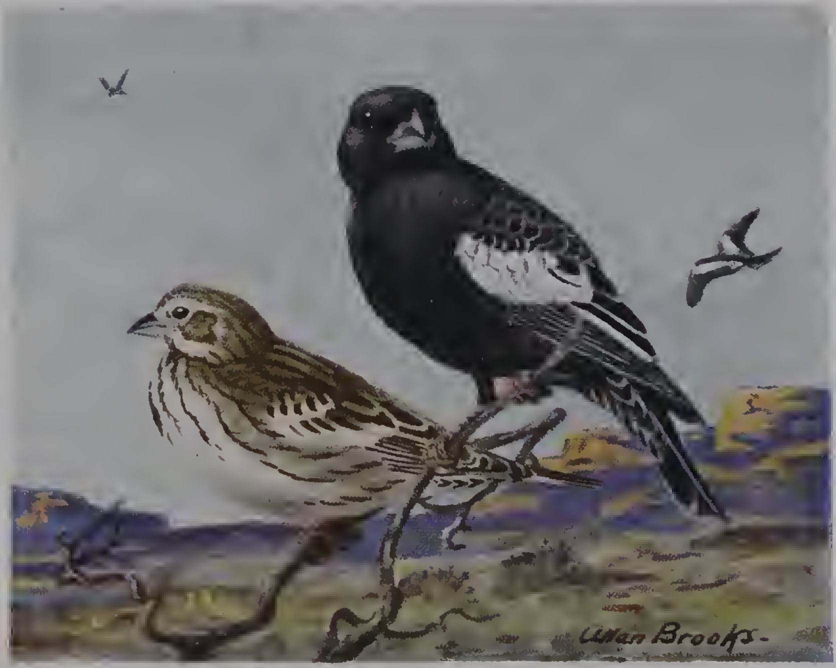
Field Marks. Spring male, like a small Blackbird with white patches on wings. Females are likely to look like female House Sparrows with a striped breast and white spots on the end of the tail feathers. Being an open-field bird, it is not often to be confused with the Purple Finch, which is essentially a tree-inhabiting species.

Nesting. On the ground; nest of grasses and fine roots.

PLATE LXI



A. Lazuli Bunting; scale, $\frac{1}{3}$
Male
Female


Allan Brooks.

B. Lark Bunting; scale, $\frac{1}{3}$
Female Male

Distribution. The plains of central North America. In Canada, southern Saskatchewan and probably adjoining parts of Alberta. There are occasional records for southern British Columbia and southwestern Manitoba.

A bird of our most southern and open prairies. It is shy and difficult to approach, but the male is recognizable at long range by its striking colour. It has a delightful flight song that has suggested the name of "Lark" Bunting.

FAMILY—TANAGRIDAE. TANAGERS

General Description. Brilliantly coloured birds; in Canada, about the size of, or slightly larger than, House Sparrow. Bills rather sparrow-like in outline, but slightly longer, and with an evenly curved culmen. Cutting edge of upper mandible toothed and notched as in Figure 273.

Distinctions. The spring males are very distinctively brilliant in colour. Autumn birds and juveniles are generally recognized by their soft, uniform yellow-green coloration, resembling some of the dull green Vireos or Warblers, but much larger. In the field, most likely to be confused with the Orioles, but less active, more sluggish, and entirely different in action and bearing.

The Tanagers are a typically American family that reaches its highest development in the tropics and is regularly represented in Canada by only two species. As a family the Tanagers are so closely related to the Sparrows that the status of some extralimital species is still undetermined.

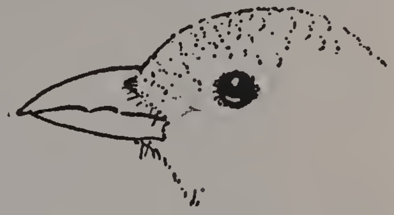


Figure 273
Scarlet Tanager, showing notched bill.

607. **Western Tanager.** LOUISIANA TANAGER. CRIMSON-HEADED TANAGER. *Piranga ludoviciana.* L, 7. Plate LXII A. Male in spring: bright lemon-yellow with crimson head and black saddle, wings, and tail; in autumn, with only traces of the crimson on head. Female and juveniles: dull yellow-green, yellowing on breast and below, with brownish wings and tail.

Distinctions. Male most like a bright male Oriole, but with crimson or nearly solid yellow head, without black crown or bib. Females and juveniles with characteristic Tanager bill (Compare Figures 273 and 257) and greener and less orange than female Orioles. Females are more difficult to separate from female Scarlet Tanagers. Geographical range is a good guide as the latter is not regularly found west of Manitoba, nor the former east of western Saskatchewan. The Western female is not as clear a green above, the back is noticeably darker than the crown and nape, instead of being evenly coloured with it, and it has distinct white wing-bars that are absent in the Scarlet Tanager.

Field Marks. The spring male: a black and yellow bird with a crimson head, is unmistakable. Female and juvenile: evenly dull greenish birds, a little larger than a House Sparrow. Much more sluggish and less agile than the Orioles. The characteristic note of the Western Tanager is an oft-repeated, quickly uttered "*Pricklydick.*"

Nesting. Nest, in trees or bushes, of twigs, rootlets, and moss, lined with soft material.

Distribution. Western North America. In Canada, east to western Saskatchewan, north to Mackenzie valley.

One of the showiest of our western birds. Though not as spectacular as the Scarlet Tanager, it is much like it in general habit. It has a pleasant little song, suggesting the rolling syllables of the Robin, but more continuous.

Economic Status. The food of the Western Tanager is composed mostly of insects, many of them of harmful species. It may, at rare intervals, take an appreciable amount of small fruit, but the good it does far outweighs the occasional damage.

608. **Scarlet Tanager.** RED BIRD. FIRE BIRD. WAR BIRD. *Piranga erythromelas.* L, 7·25. Spring male: a brilliant scarlet all over except wings and tail which are intense black. Female: dull greenish yellow, lightening to yellow on breast and underparts. Male, both adult and juvenile, in autumn similar to female, but with wings and tail black.

Distinctions. The intensely brilliant scarlet spring male, with sharply black wings and tail, is unmistakable. Female and autumn birds resemble female Orioles, but are greener and with characteristic Tanager notched bill (Compare Figures 273 and 257). They are more difficult to separate from the female and Juvenile Western Tanager. Geographical range is a good guide. Specimens from Manitoba are most likely to be this species. They are clearer green than birds of the Western species, and the back is the same colour as the head and nape.

Nesting. Usually near the extremity of a branch on small tree in nest of leaves, strips of bark, etc.

Distribution. Eastern North America. In Canada, west rarely to southern Manitoba, and has been known to occur in Saskatchewan.

The Scarlet Tanager shows remarkable seasonal and sexual plumage changes. In the spring the sexes are so entirely different that one wonders at their specific relationship, and in the summer the brilliant scarlet male gradually assumes the dull green of his mate. In midsummer some moulting males, remarkably pied in scarlet and green, may be seen.

The Scarlet Tanager is a bird of light woodlands, where large timber grows with a sprinkling of small underbrush below, but in spring it occasionally visits the orchard. On arrival in spring the Scarlet Tanager is a most conspicuous object, but as the trees put on their leaves it becomes cautious in exposing itself and if it were not for its distinctive note "*Chip-chur*" that attracts attention it would be most difficult to find. The song is cheerful, rythmical, and fairly sustained, something like a Robin's but more connected and not quite so clear.

Economic Status. The food of the Scarlet Tanager consists mostly of insects and fruit. The insects are mostly woodland species and their destruction is of importance to the forester and fruit grower. The fruit eaten is mostly wild, in fact most birds prefer wild to domestic fruit and, give an abundance of the former, seldom eat the latter. The Scarlet Tanager does no serious damage.

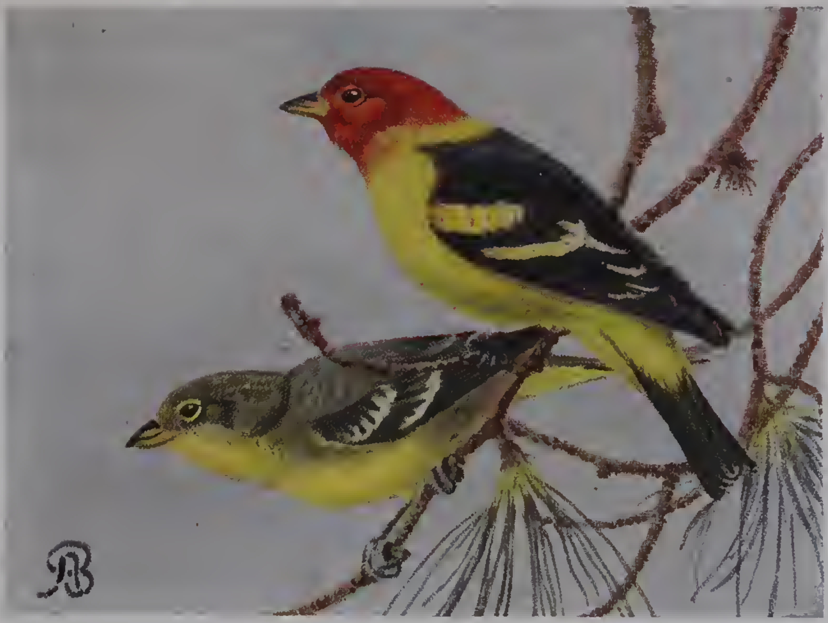
FAMILY—HIRUNDINIDAE. SWALLOWS

General Description. Mostly small birds, in Canada only one, the Purple Martin, is as large as a House Sparrow. Wings, very long and pointed; feet small and weak, unsuited to walking; head flattened and bill very short, with deep, wide gape (Figure 274 a and a′).

Distinctions. In superficial characters and general proportions as here described, Swallows resemble the Goatsuckers and Swifts, but are much smaller and entirely different in colour from the former and are not nocturnal. In the field, more likely to be confused with the Swifts. The wings, with their looser and softer feathers, the nearly straight primaries, longer secondaries (Figure 274 d and e), and the characteristic wing action are sufficient to show the great difference in the birds. The Swift beats the air with rapid, regular strokes and then sails like a bullet; the Swallow flies with long rhythmic strokes, gliding up and down invisible aerial waves, instead of boring straight through them. The legs and feet of the Swallow are more or less scaly, and not as fleshy as the Swifts (Compare Figures 274 and 244).

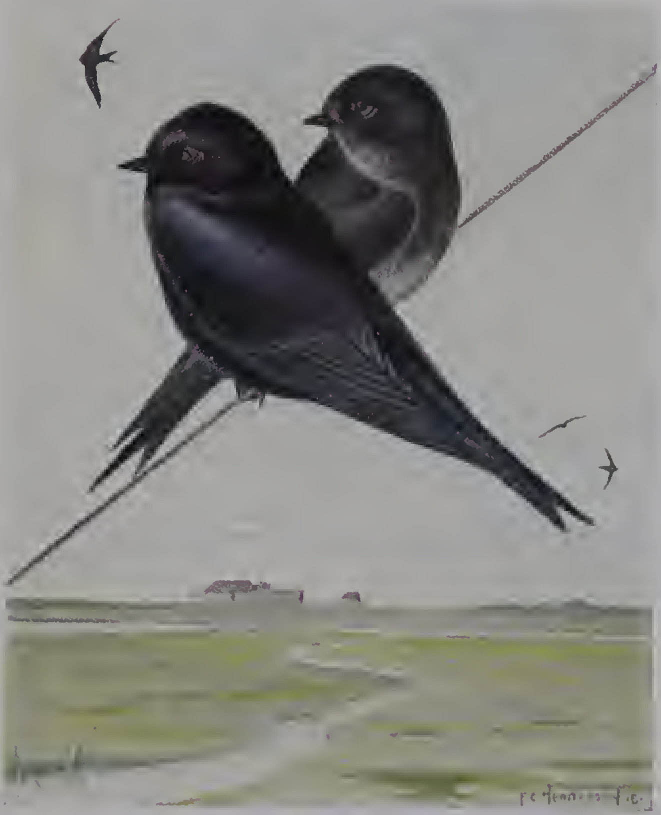
A world-wide family, of aerial habits, seldom coming to the ground except for nesting material. Their feet are weak and suitable for alighting only on small twigs, telegraph-wires, and similar perches. They take their food on the wing and can often be seen sweeping over ponds, slightly furrowing the still surface as they drink. They are skilful nestmakers and build a remarkable variety of forms, from bottle-necked structures of kneaded mud to holes tunnelled in earth banks.

Economic Status. Flying insects constitute almost the entire food of the Swallows. Sailing high or low in the air as food results justify, the Swallows attack many winged insects which are otherwise almost unmo-



A. Western Tanager; scale, $\frac{1}{3}$

Female Male



B. Purple Martin; scale, $\frac{1}{3}$

Male Female

lested. Over grain fields and about barnyards where insect-eating birds are few the Swallows congregate and give efficient assistance to the agriculturist. Their dirt is sometimes objectionable when they nest in numbers under the eaves of residences. It is well in such cases to provide suitable nesting sites for them elsewhere about the farm buildings where they can congregate without offence.

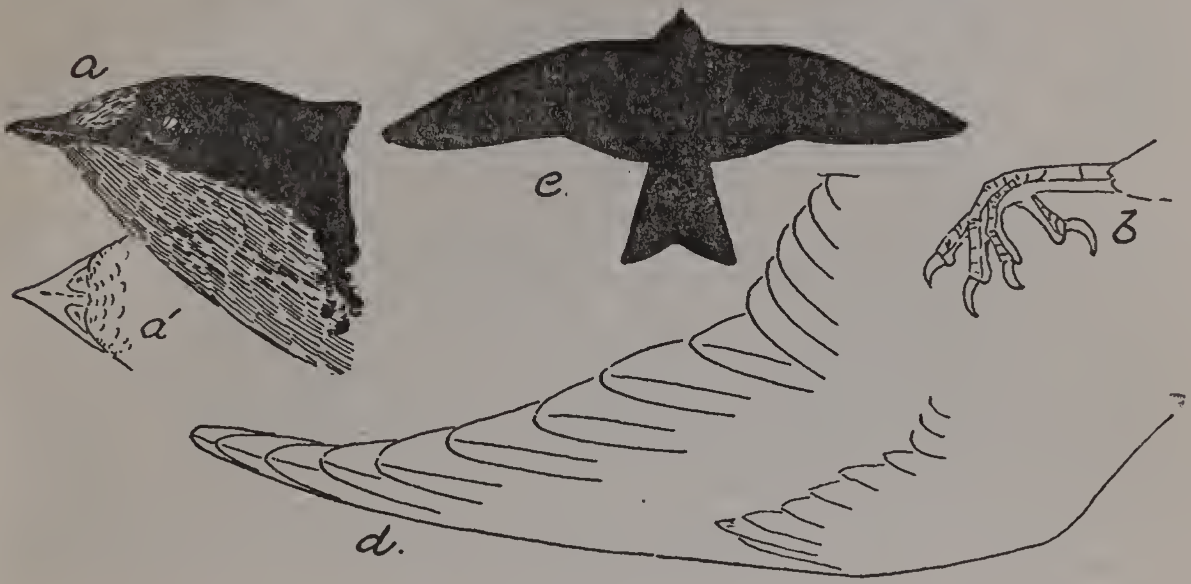


Figure 274
Characteristic details of Swallows.
a, head of Cliff Swallow. *á*, top view of bill. *b*, foot. *d*, wing tips. *e*, outline of Cliff Swallow in flight; scale, *a–d*, natural size; *e*, about ⅕.

611. **Purple Martin** (Including **Western Martin**). *Progne subis.* L, 8. Plate LXII B. About the size of House Sparrow. Adult male, solid black, with steely blue and purple reflections. Female, dark, ashy brown above, lightening across breast, and dirty white below.

Distinctions. The largest of our Swallows. Somewhat suggestive of the Black Swift, but black, highly iridescent, and a true Swallow (Compare Family details—Figure 274 with 244, page 239). The female is a big, brown Swallow, much like a Rough-winged, but larger.

Field Marks. Size, colour, strong Swallow flight, almost falcon-like in its directness, and voice make good field marks. Often seen about the business sections of the larger cities.

Nesting. Originally in holes and hollows in trees. Now, mostly in artificial bird-houses, cavities in the cornices of buildings, etc. They are sociable nesters and prefer to build in communities of their own kind.

Distribution. North and South America. In Canada, across the southern part of the Dominion, excepting the interior of British Columbia. They are common in eastern and central Manitoba, but are less numerous and rather local in Saskatchewan and Alberta and the west coast.

SUBSPECIES. The Eastern Martin *Progne subis subis* occurs west to the mountains. On the coast is found the Western Martin *Progne subis hesperia,* distinguished by the female being a little lighter in colour.

One of the most charming birds to have about. A well-occupied, Martin house in the garden adds a last homey touch to the homestead and is well worth striving for.

During the day the birds scatter over the country, returning at frequent intervals with food for their young. At evening all return to the house they occupy and retire within its shelter for the night. The young remain for a considerable time in the nest and, even after their first flight, old and young return to the nest at night. Martins are domestic and sociable birds and greet each other with welcoming gurgles and chatterings. Each is interested in the other's family affairs and there is a constant interchange of visits between neighbours. They rarely quarrel among themselves but show a united front to common enemies, especially the English Sparrow. A colony when established can hold its own against that pest very well indeed. A Martin house should contain several rooms about 8 by 8 inches, weather and draft proof at all points except the door which should be about 2 inches in diameter and 1½ inches from the floor. The house should stand 15 to 20 feet above the ground, out well in the open, and so arranged that it can be lowered for cleaning.[1]

Unfortunately, the treeless prairie is not an aboriginal home of the species and it is not as common as we should like west of Manitoba, nor has it there taken as kindly to nesting boxes as it has in the east. Wherever Martins occur, they show the same appreciation of the hollow galvanized cornices of business buildings and without doubt a little coaxing would introduce them to the advantages of well-made bird-houses. Once established in such houses, the species would probably increase. It might take some time to accomplish this as the Purple Martin is greatly attached to its home locality, and, until forced to, does not usually seek new quarters.

Economic Status. The Martin like the other Swallows is a bird with no bad habits, and with so many good ones that every effort should be made to aid its increase.

612. **Cliff Swallow.** EVE SWALLOW. MUD SWALLOW. *Petrochelidon lunifrons.* L, 6·01. Plate LXIII A. Above, except rump, steely black; rump, light tan and a white or light cream-coloured bar across the forehead. Below, dull white; face and throat, rich chestnut, blending away in the breast and on flanks. A suffused iridescent black spot on foreneck and upper breast. Tail, slightly forked when closed, nearly square when open. Female and juveniles: similar to male, but colours of the latter are duller.

Distinctions. Much like the Barn Swallow (Plate LXIII B), but without long swallow-tails; pure or nearly pure white on abdomen; face, chestnut, and a nearly white forehead bar. Rump, light tan instead of solid black like back.

Field Marks. The Cliff Swallow is a chunkily-built bird; in flight, broader in proportion than any other Swallow except the Purple Martin. In general colour effect much like the Barn Swallow, but with square tail (Figure 274 e), instead of a deeply forked one, and a prominent light tan rump-spot. The less ruddy underparts and forehead-bar nearly white instead of dull red are also good distinctions. Cliff Swallows may always easily be picked out from flocks of mixed Swallows by the rump-spot.

Nesting. A typical nest is built entirely of mud carried in little pellets in the bill and on the feet. The mud is mixed with saliva and plastered pellet by pellet on the wall under the eaves of some building. The nest is first a shelf built out from the wall, then saucer-shaped and then cup-shaped, in any of which states it may be left as finished. In the best examples the sides are continued until the nest assumes the shape of a round flask with the neck drawn over and pointing outwards.

Distribution. North America. In Canada, across the Dominion north to the limit of trees near the Arctic coast.

SUBSPECIES. The only form to be found in Canada is the Northern Cliff Swallow *Petrochelidon lunifrons lunifrons.*

Most characteristically, a cliff dweller as its name implies, but in many places it uses sides of barns and buildings for nesting sites. Along the steep canyon-like sides of many western rivers, its mud-nests may be seen in

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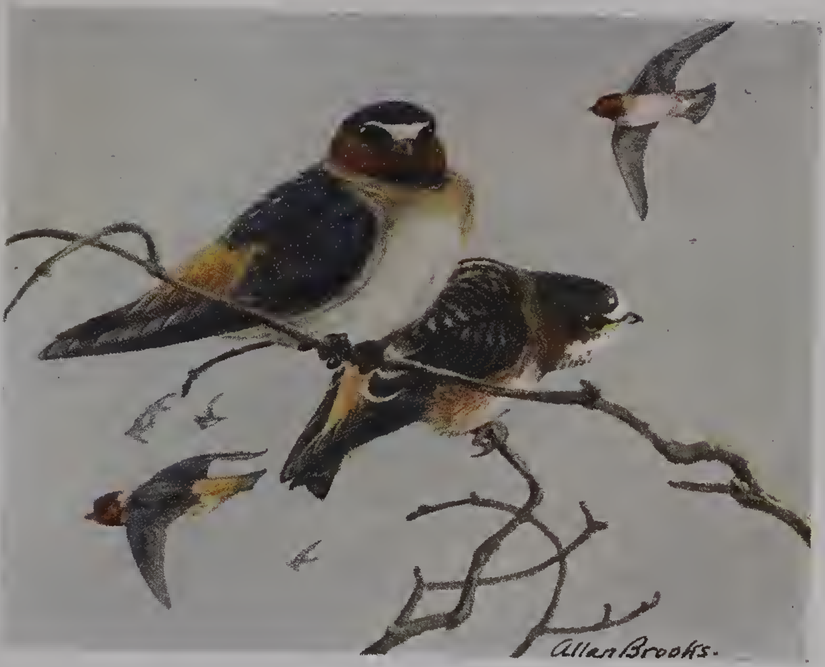
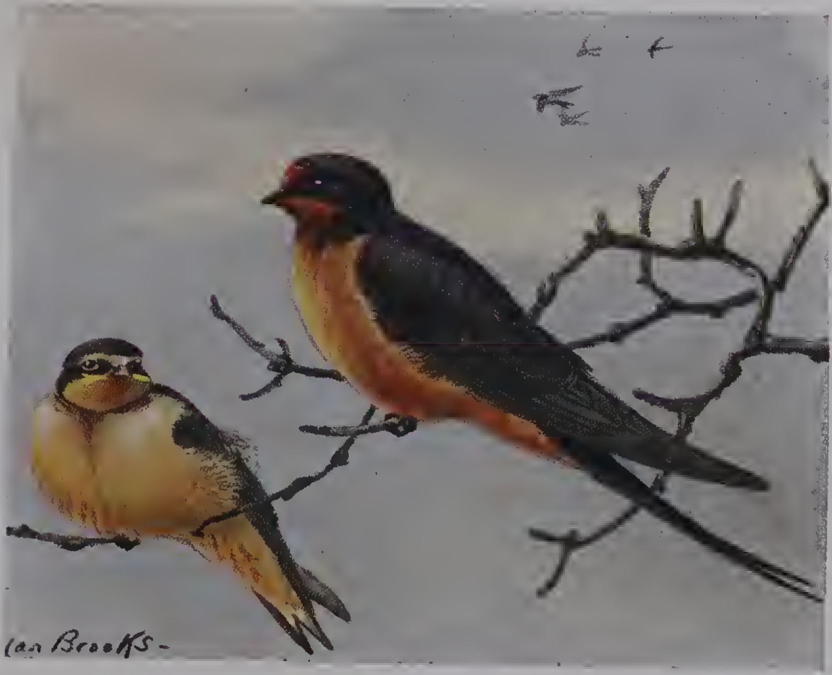
[1] A pamphlet, "Bird Houses and Their Occupants", giving full particulars how to build Martin and bird-houses, may be obtained free of charge from the Dominion Parks Branch of the Department of the Interior, Ottawa, Ontario.

PLATE LXIII


Allan Brooks.

A. Cliff Swallow; scale, $\frac{1}{3}$

Adult Juvenile



B. Barn Swallow; scale, $\frac{1}{3}$

Juvenile Adult

hundreds, covering many square yards of surface, so close together that their sides touch and are built together. It is interesting to note that, though sites are chosen apparently at random, and one occupied situation seems no more attractive than others adjoining, when the prevailing rains come, the nests, with their soluble walls, are invariably found to be on dry spots on the cliff face, in many cases the only dry spots in miles of rock front.

613. **Barn Swallow.** *Hirundo erythrogastra.* L, 6·95 (Tail fork 1·75 deep). Plate LXIII B. Adult: with deeply forked tail. All steely black above. Below, reddish-chestnut, deepest on upper breast and throat. Bar across: forehead the same as throat. A somewhat broken and imperfect black bar separating throat and foreneck patch from the lighter underparts. Females: the same. Juveniles: similar, but lighter, and often with tail ungrown, less deeply forked, or almost square.

Distinctions. The deeply forked tail of the adult is a certain specific distinction. Likely to be confused only with the Cliff Swallow, but more reddish below, face black; dark, dull chestnut forehead-bar instead of cream one; rump black like the back.

Field Marks. The long "swallow-tail" is always diagnostic of this species. When this is not present, as in juvenile birds, the rufous cast to the underparts, white in the tail feathers, and solid black rump are good recognition marks.

Nesting. The nest is far from being the beautiful structure the Cliff Swallow builds. It is largely made of mud mixed with grasses, lined with grass and feathers, and set on a support such as a rafter or beam; but often the slightest projection will be utilized as a foundation upon which to build. Some farmers ensure the presence of the birds about the place and induce them to nest where they will be unobjectionable by furnishing small supports for their nests close under the eaves of their barns or inside where they will be sheltered but can do no damage.

Distribution. North America. In Canada, north to near tree limits.

This is the Swallow commonly nesting in barns and outbuildings. It not only builds under the eaves, but enters the building and occupies the interior. Its long "swallow-tail" assists in making it perhaps the most graceful of all the Canadian Swallows.

614. **Tree Swallow.** WHITE-BELLIED SWALLOW. *Iridoprocne bicolor.* L, 5·90. Plate LXIV A. Pure white below, from throat to tail-coverts. Above, solid steely black. Juveniles have iridescent black replaced by sooty brown.

Distinctions. The adult uniform steely black above, and pure white below, is unmistakable. Except from the Violet-green Swallow in British Columbia, juveniles can be distinguished by the purity of their white underparts and absence of any breast-band. A glance at the colours of the backs will separate adults from the Violet-green, but young birds may be difficult to recognize except by direct comparison with specimens. The Tree Swallow is a little larger, and the brown of the back is a little browner and less greyish.

Field Marks. A contrastive black and white Swallow. Likely to be confused only with the Violet-green Swallow of British Columbia. It has two very distinct and easily recognizable field distinctions. The face and cheeks are black, not strikingly white, and in flight the rump shows solidly black, without white spots on either side that are characteristic of the Violet-green.

Nesting. In Woodpeckers' abandoned nest-holes or other cavities in dead stubs, or in nesting boxes, preferably near or over water. Lined with grasses and feathers.

Distribution. North America. In Canada, north to near tree limits.

Though normally using Woodpeckers' holes in dead stubs over the water the Tree Swallow is easily induced to nest in boxes in the garden. The beauty of its bright iridescence and the grace of its flight make ample payment for the work of preparation, even if its presence were not an important safeguard against insects in the garden. The continued existence of the species is threatened through the growing scarcity of natural nesting sites and an effort should be made to supply the nests artificially.

615. **Violet-green Swallow.** *Tachycineta thalassina.* L, 4·75. Plate LXIV B. Solid white below from throat to undertail coverts, and extending over face to include cheeks. Above: head to rump a rich velvety bottle green, washed with violet and bronze; rump and tail glossy, dark violet. Female similar but duller. Juvenile has the violet and green colours above replaced by ashy brown.

Distinctions. Adult birds, or those with any indication of the violet and green above, are unmistakable. Juveniles with their pure white underparts can be mistaken only for the Tree Swallow. Sometimes differentiation between them may be difficult without specimens for comparison. The Violet-green is distinctly smaller and the brown of the upperparts is generally greyer and less brownish.

Field Marks. With its black-appearing back and upperparts and pure white underparts, to be mistaken only for the Tree Swallow. It has two excellent marks for field distinction, however. The cheeks are clear white, giving a white face that is lacking in the Tree Swallow, and in flight a sharp white spot shows on either side of the dark rump. The only other similar bird having such white rump spots is the White-throated Swift, so far found in Canada only in the lower Okanagan valley and a true Swift and not a Swallow. Note distinctions under family (page 302).

Nesting. Nest in crannies of high perpendicular cliffs, frequently in holes in trees and occasionally in bird-houses or about buildings. Nest of grasses with feathers when procurable.

Distribution. Western North America. In Canada, British Columbia north through central Yukon. Probably adjoining foothills in Alberta.

SUBSPECIES. The form of northern North America is the Northern Violet-green Swallow *Tachycineta thalassina lepida.*

One of the loveliest of the Swallows. Its distinctive violet and green colours can rarely be discerned in life and to the eye it flashes in the sun in contrastive black and white. It is seen to best advantage in the narrow, steep mountain valleys of the interior, skimming close to the lower ground or high up in the blue in flocks that weave in and out amongst themselves in complicated pattern. Their nests may be up a steep mountain face, so high that only a white spot on the rocks at the entrance to a community niche marks the spot, and from the ground below the birds can hardly be distinguished with the naked eye as they enter or leave; even powerful glasses may leave the observer in doubt as to whether the moving specks are Swallows high up or flies lower down. The species will nest in boxes about the house when such cliffs are not immediately available.

616. **Bank Swallow.** SAND MARTIN. *Riparia riparia.* L, 5·20. Plate LXV A. Above, dull brown; below, white with a sharp brown band across chest. Females like male. Juvenile similar, but the breast-band more diffuse.

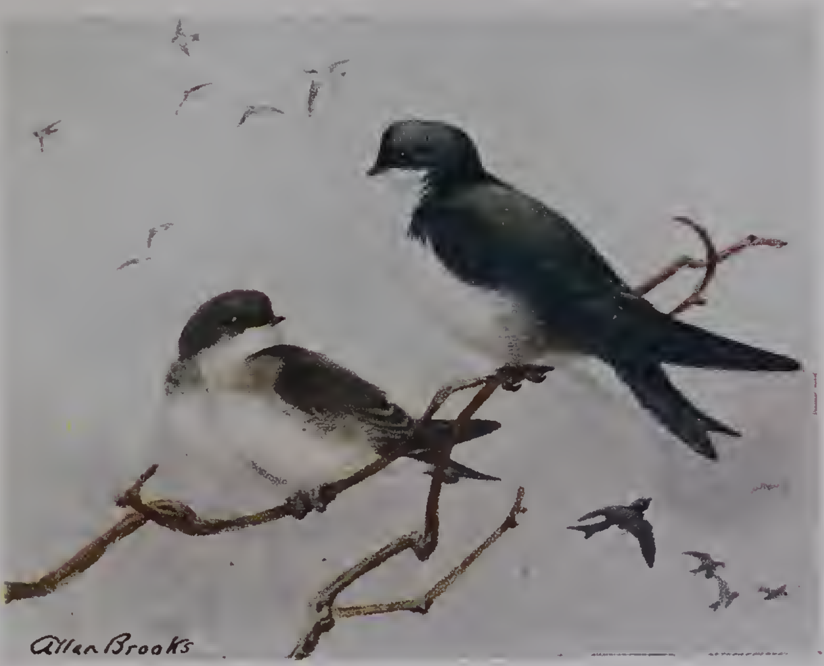
Distinctions. Dull brown instead of iridescent back; white underparts with decided dark breast-band, extending, in juvenilty, towards the abdomen. The complete breast-band will separate the Bank from the Tree or Violet-green Swallows that also have white underparts, and from the Rough-winged Swallows in which the white is less pure and the throat and breast are evenly suffused with ashy brown.

Field Marks. A white-bellied Swallow with complete dark breast-band. A sturdily built bird. This character is most noticeable when flocks of mixed species are lined up on telegraph or other wires.

Nesting. Nearly everyone has seen how quickly the exposed sides of a sand or gravel pit excavation become pitted with the small nesting holes of these Swallows. Too often the heedless small boy digs them out. Not only is this dangerous to the boy from the possibility of the bank caving, but it is a totally unnecessary disturbance of a very valuable species.

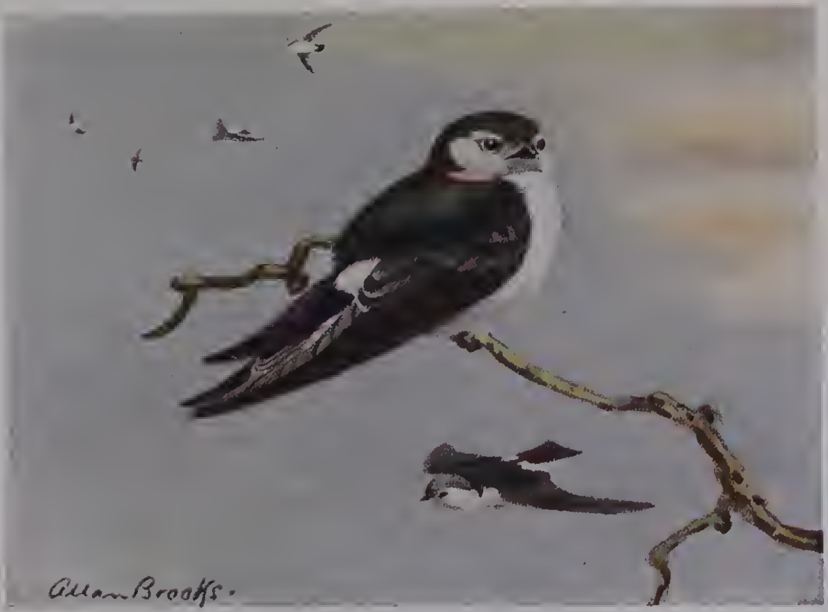
Distribution. Northern hemisphere. In Canada, across the Dominion, north to tree limits. Rarer on the west coast.

617. **Rough-winged Swallow.** *Stelgidopteryx serripennis.* L, 5·75. Dark brown and white like the Bank Swallow (*See* Plate LXV A), but with breast and throat suffused with light ashy-brown instead of crossed by a well-defined breast-band.



A. Tree Swallow; scale, $\frac{1}{3}$

Juvenile Adult



Allan Brooks.

B. Violet-green Swallow; scale, $\frac{1}{3}$

Distinctions. The uniform suffusion of light ashy-brown on throat and breast will usually distinguish this bird from any other Swallow likely to be compared with it. The surest test, however, is the roughness on the edge of the web of the outer primaries, composed of fine recurved hooks at the ends of the outer webs, barely visible to the naked eye, but in adults plainly perceptible to the touch as the finger is drawn along the edge towards the tip (Figure 275). Young birds do not always show this well, and various stages of the serration appear according to age and sex.

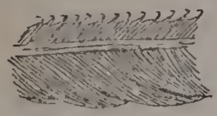


Figure 275
Showing hooks on outer edge of outer primary. Rough-winged Swallow; magnified.

Field Marks. Likely to be confused only with the Bank Swallow. The best recognition mark against that species is the even suffusion of light greyish-brown over throat and breast instead of a white breast and throat with a more or less defined dark breast-band. In watching a flock of mixed Rough-winged and Bank Swallows, the former can usually be picked out by its slightly redder or rustier back, which seems sometimes more conspicuous in life than in the hand.

Nesting. Similar to the Bank Swallow, in holes in sand-banks. Sometimes in sawdust piles of sawmills and occasionally in crevices in rock piles, cliffs, and masonry. More solitary than the Bank Swallow and does not nest in dense colonies.

Distribution. North America. In Canada, most of the southern parts across the Dominion. In the west, common in the wooded parts of southern Manitoba and southern British Columbia. Not detected so far in the provinces of Saskatchewan and Alberta.

The Rough-wings belong to a genus widely scattered over the world, characterized by the peculiar modification of the wing, the use or purpose of which is not at present known.

FAMILY—BOMBYCILLIDAE. WAXWINGS

The Waxwings are striking birds distributed over the northern parts of both the New and Old Worlds. They are represented in America by two species, so nearly alike and so well characterized in form and colour that description here is unnecessary. There is remarkably little seasonal or sex variation and Plate LXV B and Figure 55, page 32, designate them plainly. The shafts of the secondaries and sometimes those of the tail are enlarged at the tips into brilliantly coloured appendages having a close resemblance to bits of sealing-wax.

618. **Bohemian Waxwing.** WANDERING CHATTERER. *Bombycilla garrula.* L, 8. Almost exactly similar in form and colour to the Cedar Waxwing (*See* Plate LXV B), but larger, the secondaries are tipped with white and most of the primaries with white or yellow or both; there is likewise a small white wing-bar. The undertail-coverts are chestnut and the abdomen greyish without the yellow suffusion.

Distinctions. No further distinctions are necessary; the Cedar Waxwing is the only species with which it can be confused.

Field Marks. Their trim figures and conspicuous crests easily identify the Waxwings. The white or yellow on the wings and the chestnut undertail-coverts are the best specific field marks.

Nesting. In trees, in nest of twigs, roots, moss, etc.

Distribution. The northern parts of the northern hemisphere in both New and Old Worlds. In Canada, breeding in Mackenzie district, northern British Columbia, and down the eastern slopes of the Rockies, irregularly to southern Alberta. Migrating in winter irregularly south and east over most of the Dominion.

Their irregular wandering habits in winter have given these birds the name "Bohemian" which in this sense is synonymous with "wandering." They are northwestern birds, but come into cultivated sections irregularly in winter, as does the Evening Grosbeak. They are too rare to have any great economic influence. Their favourite food is the dried waste fruit that hangs throughout the winter.

619. **Cedar Waxwing.** CEDAR-BIRD. CAROLINA WAXWING. CHERRY-BIRD. *Bombycilla cedrorum.* L, 7·19. Plate LXV B. A very neat, nattily plumaged bird, about the size of a House Sparrow. Soft brown fawn over head, breast, and back, changing to slate-grey on rump and pale yellow on abdomen. A prominent, sharp-tipped, erectile crest; a black bar through eyes; chin-spot of same colour. Tail tipped with lemon, as if dipped in paint. Small, reddish appendages like bits of sealing wax on tips of secondaries and sometimes on tail feathers:

Distinctions. To be mistaken only for the Bohemian Waxwing, but is decidedly smaller; yellowish instead of faintly greyish beneath, without yellow or white on wings, and undertail-coverts creamy white instead of rich chestnut.

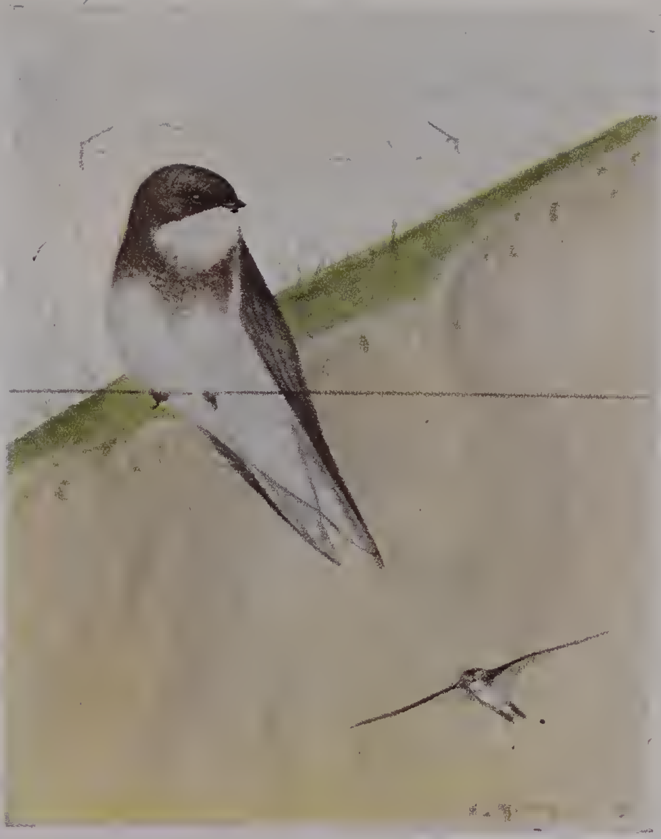
Field Marks. The natty shape and bearing, with conspicuous, usually upstanding, crest are easily recognizable field marks for this bird as a Waxwing. Small size, yellowish underparts, total lack of red under the tail, and absence of yellow or white markings on closed wing will separate it from the Bohemian Waxwing. This is the Waxwing most likely to be seen in southern Canada during the summer. Any such bird seen, except in winter, should be assumed to be this species until positive Bohemian details are recognized. The note, a fine sharp wheeze, is distinctive and soon learned.

Nesting. In fruit or shade trees or in bushes. Nest of strips of bark, leaves, grasses, twigs, rootlets, or moss, lined with finer materials of same nature.

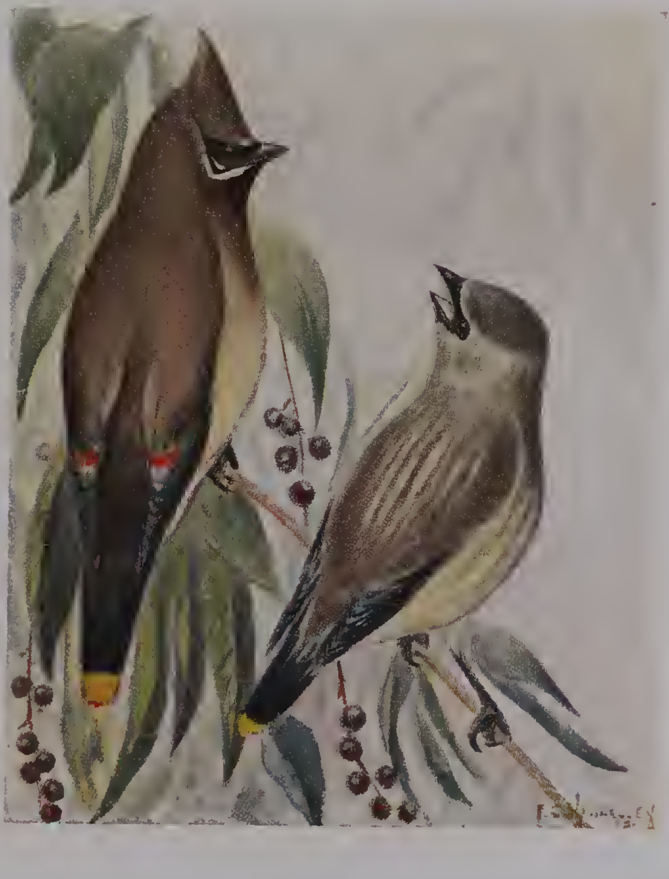
Distribution. North America. In Canada, north to well into the northern boreal forest.

The Cedar Waxwing is one of the familiar birds of the orchard. It builds in the fruit trees and is rather too well known in the vicinity of early ripening cherries. In the winter it seeks the various kinds of old dried fruit left hanging on the branches. The coloration is soft and harmonious with just enough accent of contrast to give character. The peculiar smooth silky texture of the plumage causes the feathers to cling together so that they always lie smoothly and are never awry. The red sealing-wax-like processes in which the shafts of the secondaries and sometimes the tail feather end, common to this and the Bohemian Waxwing, are unique amongst American birds and give an added touch of individuality.

Economic Status. About 13 per cent of the Waxwing's food is noxious insects, the remainder largely fruit. The greater part of the fruit is wild and of no economic importance, in fact, as with most birds, wild fruits are evidently much preferred to cultivated ones. However, when early cherries ripen before the wild, the damage Waxwings can do is considerable. The same amount of fruit distributed over many later trees might pass unnoticed, but when the damage is concentrated upon the earliest and most valuable part of the crop the loss may be keenly felt. The protection of early fruit from the depredations of this and a few other species of like habit is a subject that has received considerable attention. To shoot all birds visiting the orchard is one solution, but a very poor one. It gives only partial protection and has to be repeated each season; for as long as any remain in the vicinity the annual increase will undo the results of previous efforts. Besides, the entire community is deprived of the valuable assistance of a number of species in order that a certain amount of early fruit may be protected for a few individuals. As the birds prefer wild to cultivated fruit, early ripening wild fruit trees in waste corners and along fences provide inexpensive protection. The Russian mulberry and serviceberry and, later, the black currant, mountain-ash, raspberries, and blackberries, sumach, alder, wild grape, bittersweet, nightshade, snowberry, and elders, according to the fruit possibilities of the locality, will serve the purpose.



A. Bank Swallow; scale, $\frac{1}{3}$



B. Cedar Waxwing; scale, $\frac{1}{3}$

Adult Juvenile

FAMILY—LANIIDAE. SHRIKES. BUTCHER-BIRDS

General Description. The Shrikes are medium-sized Passerine birds of raptorial nature. They are easily recognized by their bills which are plainly hooked and furnished with a notch and tooth at the tip of the upper mandible (Figure 276). The two species which occur in Canada are very similar in coloration and differ in minor characters only (Plate LXVI A).

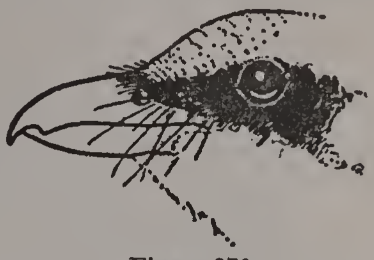


Figure 276
Shrike (Loggerhead); natural size.

The Shrikes are interesting examples of Passerine or seed and insect-eating birds adapted for a predatory life. The true *Raptores*, the Hawks, etc., which also prey upon the higher living forms, have powerful feet with which to secure their food and hold it while they tear it with their bills. The Shrikes are without these efficient grasping and holding members, having in fact feet scarcely stronger than those of a Sparrow or Blackbird of equal size. They, therefore, seize prey with their bill and, to hold it while feeding, have evolved the habit of impaling it upon strong thorns, etc.; this habit gives them the popular title of Butcher-birds. Shrikes are bold and spirited and quite as daring and capable in proportion to their size as any of the true Birds of Prey. The family is large and widely distributed. Only one genus is represented in America and two species in North America.

621. **Northern Shrike.** BUTCHER-BIRD. *Lanius borealis.* L, 10·32. Nearly as large as a Robin. Almost identical in coloration with the Loggerhead Shrike (*See* Plate LXVI A), but considerably larger and with a series of well-defined, fine, wavy lines or vermiculations across most of the underparts. Juveniles overwashed with rusty.

Distinctions. General coloration and notched bill (Figure 276) will distinguish it as a Shrike. Size, distinct vermiculation below, and late autumn or winter season of occurrence in the regularly settled parts of Canada will characterize it as the Northern.

Field Marks. The sharply contrasted black and white wings, grey back, and black bar through eye will give easy recognition to either of our Shrikes. Size, vermiculated breast, and late autumn or winter occurrence as above will designate this species.

Nesting. In low trees or bushes, nest of twigs, grasses, etc.

Distribution. Northern North America, breeding in the west from Great Slave lake northward and into Alaska. There is great confusion in the older breeding records between the two species of Shrikes. None of the more southern nesting reports of this bird has ever been satisfactorily substantiated. Great caution should be used in identifying before reporting it in southern latitudes in summer.

The Northern Shrike is the bolder and more energetic of our two species. It is a northern breeder and is seen only in cultivated sections in the winter where it follows the flocks of Snow Buntings, Redpolls, etc. It has shown some tendency to come into cities and villages in pursuit of the House or English Sparrow, in which work it is to be encouraged in every way. Dry, mummied mice and birds occasionally found pinned to thorns and barbs of wire fences or hanging from the close forks of twigs are usually the remains of victims of this species. Rather surprisingly, it exhibits considerable musical ability even in winter.

Economic Status. Though thoroughly raptorial in habit the Northern Shrike cannot be said to do a great amount of damage. It is not common enough within settlement to be a serious factor in the small bird life of the fields. It catches numbers of mice and probably its attacks on them and on the House or English Sparrow compensate for the seed-eating birds it takes.

622. **Loggerhead Shrike** (Including **Migrant, White-rumped,** and **California Shrikes**). BUTCHER-BIRD. *Lanius ludovicianus.* L, 9. Plate LXVI A. Somewhat larger than a Sparrow, smaller than a Robin. Crown and back soft, even, light slate-grey, lightening on rump sometimes to white. Wings and tail black; the former with white bar across base of primaries and tips of secondaries; the latter with outer feathers largely white from the tip. All below white. A conspicuous broad, black bar through eye and along cheek. Sexes alike.

Distinctions. The coloration of grey back, black and white wings and tail, black face bar, and white below, is distinctive for the Shrikes. Separable from the Northern Shrike by smaller size (wing under 4·25) and the lack of distinct dark vermiculations across underparts. Juveniles and extreme western birds may have a faint vermiculation on breast and flanks, but it is soft and undecided, and not strong and distinct.

Field Marks. Grey back, white below, black and white wings and tail, and black bar across face are distinctive of Shrikes. Small size and summer occurrences in southern Canada are the best recognition marks for the species.

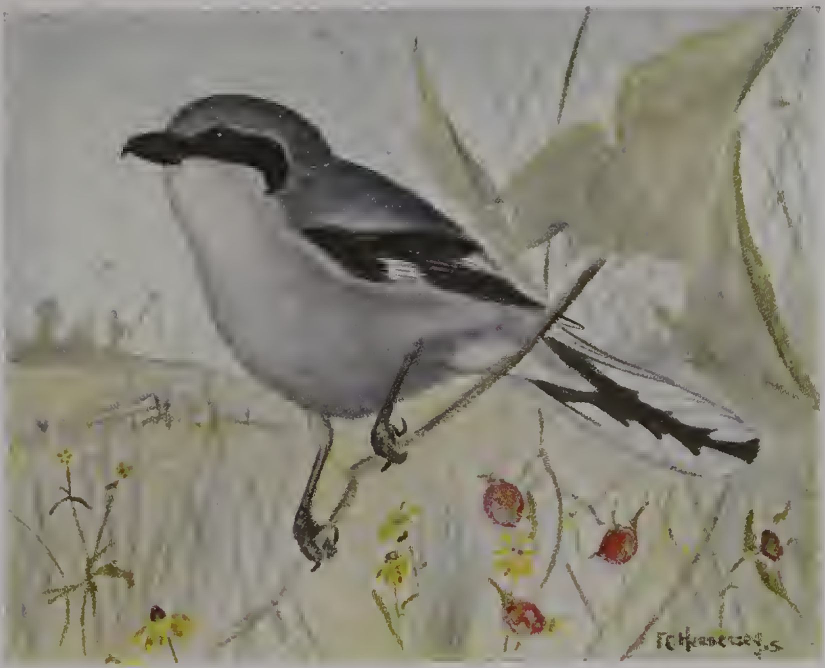
Nesting. Nest of strips of bark, small twigs, vegetable fibres, lined with felted wool and feathers, in bushes or small trees, usually in those of thorny nature.

Distribution. North America. In Canada, throughout the southern parts; rare n southern British Columbia.

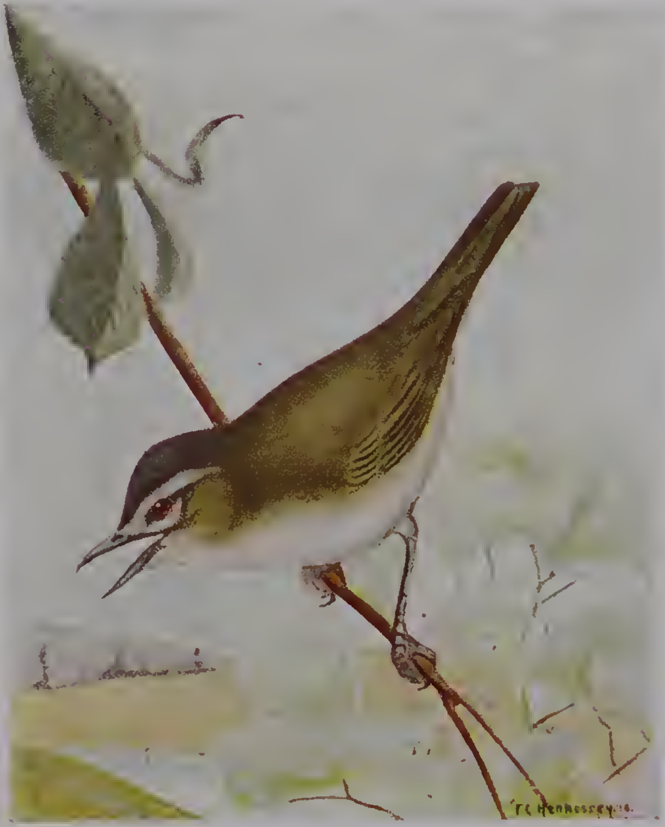
SUBSPECIES. A number of subspecies of this bird are recognized in the Check-list, and according to most authorities the name Loggerhead is applied to a more southern form, though it seems fit to apply it here to the whole species. The eastern Canadian form is the Migrant Shrike *Lanius ludovicianus migrans.* It extends west probably to the eastern bluffy parts of Manitoba, though it is separated from the next form by such slight and variable characters that the geographical boundary between them is rather uncertain. Over the prairies westward is the White-rumped Shrike *Lanius ludovicianus excubitorides,* that extends to the mountains. It is very slightly paler grey, with whiter rump and more white on tips of scapulars. In southern British Columbia, the California Shrike *Lanius ludovicianus gambeli* occurs as a straggler. It has a back like the Migrant, a rump like the White-rumped, but is slightly browner than either and has suggestions of vermiculations on chest and sides of breast in the adult as well as the juvenile.

The Loggerhead is a bird of open, brushy pastures and hillsides. Thornapple or similar thorny trees, cropped and trimmed by cattle until dense and repellent, are its favourite nesting sites, and in such neighbourhoods it may be seen, usually on a commanding perch, such as the tip of a dead sapling, or a telegraph-wire, keenly regarding the surrounding country. The impaling of prey is not quite so strongly developed a habit in this species as in the previous one, probably because it eats more insects and can handle much of its smaller prey without so doing. At any rate evidence in the form of remains stuck on thorns is somewhat rare in haunts of the species and where they would be expected to be plentiful. The song of the Loggerhead Shrike is quite musical and pleasing, but the call-notes are harsh and discordant.

Economic Status. The food habits of the Loggerhead are similar to those of the Northern Shrike, differing only as would be expected in a smaller and weaker bird and a summer rather than a winter resident. Thus we find that fewer birds and mammals and more insects are taken, indeed during the height of the insect season insects seem to constitute the greater part of its food. Early in the summer great numbers of beetles are eaten, useful and harmful forms being about equally divided in numbers. Later, grasshoppers and crickets form a large proportion of the food, but numbers of caterpillars—many of them hairy—cutworms, some wasps, spiders, and other insect forms are also taken. The food of the species throughout the year is regarded by the United States Biological Survey as being beneficial in the ratio of 4 to 1.



A. Loggerhead Shrike; scale, $\frac{1}{3}$



B. Red-eyed Vireo; scale, $\frac{1}{2}$

FAMILY—VIREONIDAE. VIREOS OR GREENLETS

General Description. Small, warbler-like birds generally coloured in green and white with more or less yellow in softly suffused masses and without much definite marking. The bill is perceptibly notched and hooked at the tip (Figure 277) much like that of the Shrike, but is on a much smaller and lighter scale.

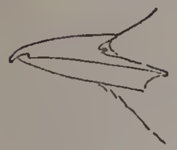


Figure 277
Notched bill of Vireo (Red-eyed); natural size.

Distinctions. The Vireos are most likely to be mistaken for Warblers which in habit, size, and general coloration they resemble. The bills, however, are stouter, more strongly arched on the culmen, higher for the width, and more evidently hooked and notched at the tip. The Yellow-breasted Chat (Figure 300, page 328) has a bill that might answer this description in outline, but it is neither hooked nor notched.

Field Marks. In addition to specific markings, which form the best guide to species, the Vireos can be recognized by their warbler-like habits but slower and more sluggish movements, peering under leaves and gleaning from the branches and twigs with less activity.

The Vireos constitute a small family of treetop birds peculiar to America. Three genera occur in Canada, represented by six species.

Economic Status. Economically the Vireos may be treated together as they are similar in their food habits. Their food consists of 91 per cent of insects and the remainder of fruits that are almost without exception wild varieties. The insects taken are among the most harmful, including scales and other close-lying species that no birds but the careful, close-peering Vireos ordinarily seek. They are among our most useful birds.

624. **Red-eyed Vireo.** PREACHER-BIRD. TEACHER. *Vireosylva olivacea.* L, 6·23. Plate LXVI B. Of the size of a small Sparrow. White below, dull greenish olive above, with a grey crown, and decided white eyebrow stripe. Sexes alike.

Distinctions. The Red-eyed may be distinguished from other Vireos by its superior size, lack of yellow, the grey confined to the crown, and the white eyebrow-line bordered with dark both above and below. The iris is red, but this can be seen only on very close examination.

Field Marks. The markings of the face of the Red-eye make the best field mark. The white eyebrow bordered with darker colour and the lower line through the eye can usually be seen as the bird peers through the leaves at the intruder.

Nesting. Suspended from between the forks of a small branch 5 to 15 feet above the ground in pensile nest or hanging-cup, woven of strips of bark, dead-wood fibres, paper, plant down, or birch-bark, lined with fine materials.

Distribution. North and South America. In Canada, north to Mackenzie valley, west to Vancouver island.

The Red-eyed Vireo is one of the commonest frequenters of our groves and woods. Its song, a leisurely repetition of slight variants of the same phrase with pauses between, and continued *ad libitum*, can be heard in the treetops almost anywhere in Canada and has given the species the name of Preacher-bird.

626. **Philadelphia Vireo.** *Vireosylva philadelphica.* L, 4·75. Almost exactly similar in size, form, and coloration to the Warbling Vireo (Plate LXVII A), but more generally suffused with yellow on the breast, flanks, and underparts.

Directions. The Philadelphia is likely to be mistaken only for the Warbling Vireo, but is yellower below and can always be separated by the first visible primary being nearly as long as the next (Figure 278), instead of being reduced to rudimentary conditions (compare with Figure 279).

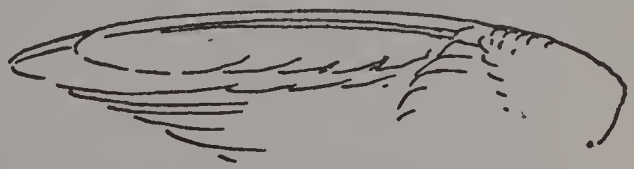


Figure 278
Underwing surface of Philadelphia Vireo, first primary long; natural size.

Field Marks. In life it looks like a Warbling Vireo with unusually yellow underparts. The light superciliary stripe is usually a little stronger than in that species, and may, at times, suggest the head of a small Red-eyed Vireo.

Nesting. Nest pensile, suspended from a branch, of fibres and birch-bark.

Distribution. Eastern North America. In Canada, west to Alberta and north to lake Athabaska.

A rather rare little Vireo, too inconspicuous to be seen or recognized by the casual observer.

627. **Warbling Vireo** (Including **Western Warbling Vireo**). *Vireosylva gilva.* **L,** 5·80. Plate LXVII A. A small Vireo, looking like a dull, grey-green Warbler. Above: dull grey, slightly olive, especially on rump. White below from throat to tail-coverts. A faint, light eyebrow-line.

Distinctions. One of the dullest, most inconspicuously-coloured birds we have, withou any special detail in marking except the soft superciliary line. In general, most like the Tennessee Warbler, but duller coloured; less green on back and less grey on crown, and with Vireo hooked bill (*See* Figure 277). The even, unmarked coloration will separate it from any other Vireo except the Philadelphia. The lack of yellow overwash on throat and below will usually be diagnostic from that species. The finally determinative character of this Vireo, however, is the rudimentary condition of the first primary, barely three-quarters of an inch long (Figure 279 compare with 278).

Field Marks. Like a small, dull-greenish or greyish Warbler, but more evenly and less conspicuously coloured than any of them, the only pattern detailed being a soft, faint eyebrow stripc. Rather slower in action and less agile than a Warbler. Separated from the other Vireos by smaller size and duller coloration, expecially the lack of yellow below and the faintness of the eyebrow stripe.

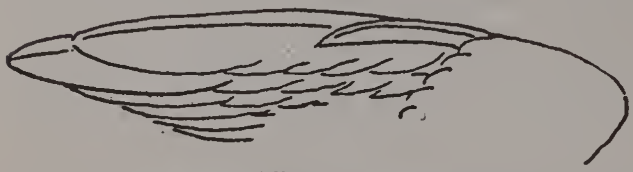


Figure 279
Underwing surface of Warbling Vireo, first primary very short; natural size.

Nesting. Nest pensile, suspended from forks of small branch, composed of fine bark strips and plant fibres, smoothly and firmly interwoven and lined with pine needles and hairs.

Distribution. Temperate North America. In Canada, across the Dominion, north to Mackenzie valley.

SUBSPECIES. Divided into Eastern and Western forms. The Eastern Warbling Vireo *Vireosylva gilva gilva* ranges west to the mountains. The Western Warbling Vireo *Vireosylva gilva swainsoni*, declared to be slightly smaller and darker, occupies British Columbia and some of the more eastern territory to the north in Alberta and Mackenzie. The two races are so difficult to differentiate that the distinction of the two ranges has not been well defined.

The Warbling Vireo, hidden in the leafy treetops, is more often heard than seen. Its song is unlike that of the Red-eyed or even its closer relative the Philadelphia, being a rather long, continuous warble, which in summer is one of the most characteristic sounds in its habitat.

628. **Yellow-throated Vireo.** *Lanivireo flavifrons.* **L,** 5·95. Slightly smaller than the Red-eyed and larger than the Warbling Vireos. Head, cheeks, and back greenish; rump and tail slaty; breast and throat bright yellow; white below. Wings with two distinct bars.

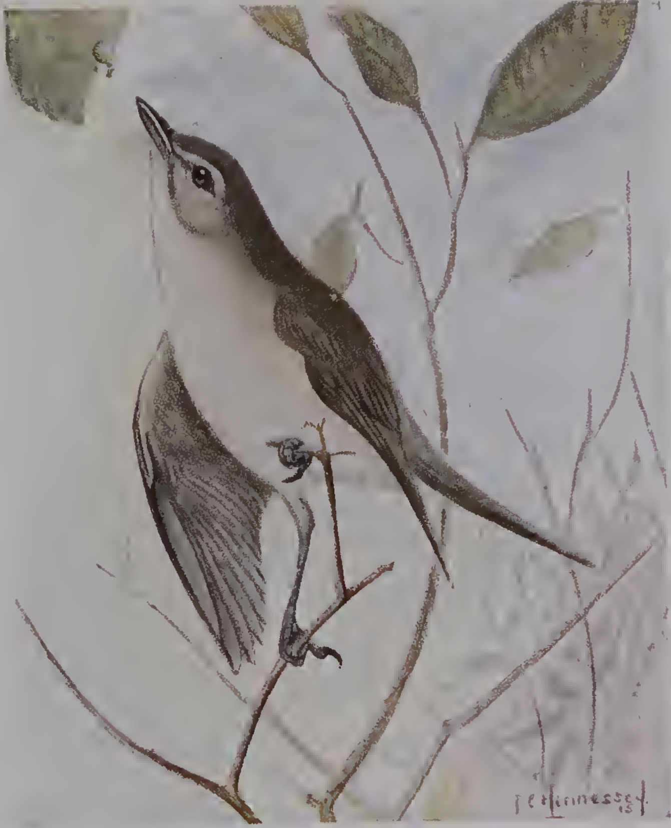
Distinctions. The bright yellow of the breast of this species is distinctive amongst the Vireos. It has white wing-bars; the Solitary is the only other Vireo within its range that has this character. In general coloration, the Yellow-throated Vireo is most like the Pine Warbler, but has considerably more white on the underparts and the yellow ends almost sharply at the breast-line. The finely hooked bill (Figure 277), of course, will distinguish it as a Vireo.

Field Marks. The bright yellow on throat will prevent confusion with any other Vireo, and the larger amount of white and the decided termination of the yellow breast against it will separate it from the Pine Warbler. Its voice is much like that of the Red-eyed, but the notes follow each other more slowly.

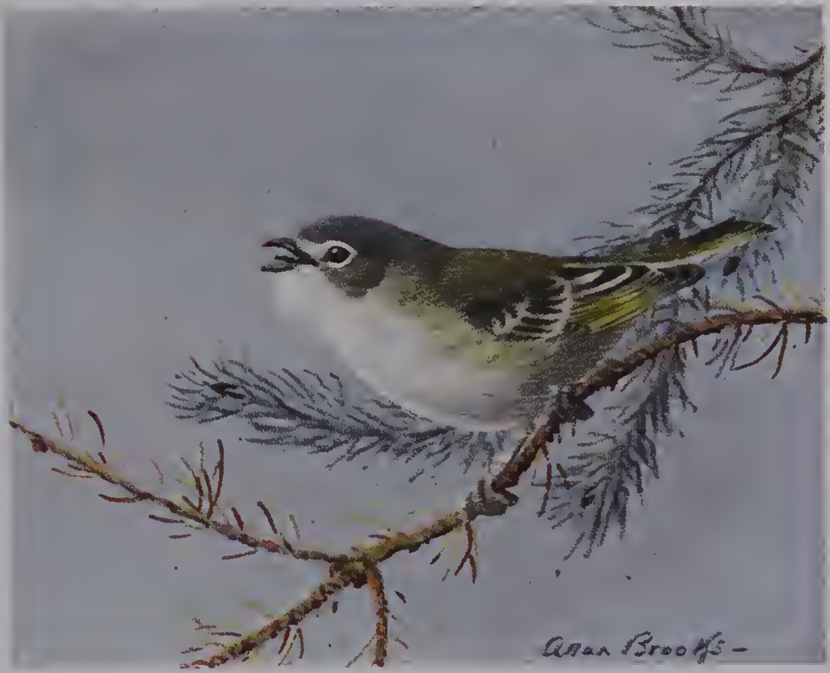
Nesting. Nest pensile, from fork of branch, of strips of bark, plant fibres, etc., lined with fine grasses and covered externally with lichens and spider webs.

Distribution. Eastern North America. In Canada, only in the most southern parts, west to and including southern Manitoba.

Plate LXVII



A. Warbling Vireo; scale, $\frac{1}{2}$



B. Solitary Vireo; scale, $\frac{1}{3}$

629. **Solitary Vireo** (Including **Cassin's Vireo**). *Lanivireo solitarius.* L, 5·61. Plate LXVII B. A little smaller than the Red-eyed, larger than the other Vireos except the Yellow-throated. Back, greenish, shading into grey on head and face; white loral spot and ring about eye; all underparts white with suffusion of yellow and olive on flanks; two white wing-bars.

Distinctions. The ashy-blue crown and face and the conspicuous white lores and eye-ring.

Field Marks. The Solitary Vireo has a rather thick-headed appearance in life. It is the only Canadian Vireo with conspicuous or decided markings. The bluish crown and cheeks contrasted with pure white lores, eye-ring, and throat are very distinctive and the bird is not likely to be mistaken for any other species.

Nesting. Nest pensile, between the forks of a branch, of wood fibres, bark strips, pine needles, and plant-down.

Distribution. North America. In Canada, across the Dominion. In the central provinces north to Mackenzie valley, but, in British Columbia, confined to the southern parts.

SUBSPECIES. Canadian birds divided into two subspecies. The Blue-headed Vireo *Lanivireo solitarius solitarius* extends west to the mountains. In British Columbia we find Cassin's Vireo *Lanivireo solitarius cassini,* somewhat duller, darker in coloration; the grey head not so sharply defined from the green back.

The Solitary is the brightest coloured and the prettiest of our Vireos, and a common resident or migrant of woodland or orchard. Its notes are reminiscent of those of the Red-eyed, but more varied and contain some harsh, scolding notes.

632. **Hutton's Vireo** (Including **Anthony's Vireo**). *Vireo huttoni.* L, 4·75. The smallest of the Canadian Vireos. Like a Warbling but generally darker, more dull olive above and below, with a pale, indistinct ring about eye and white wing-bars.

Distinctions. As above.

Field Marks. Like a small, dark Warbling Vireo, with pale eye-ring and white wing-bars. Likely to look more like a female Ruby-crowned Kinglet, except for size, than anything else. Its songs and notes are very distinctive and unlike those of any other bird it is likely to be confused with.

Nesting. Nest semi-pensile, from forks of branch; of mosses lined with fine grass.

Distribution. Western United States and Mexico. Occurring regularly in Canada only on southern Vancouver island, rare in migration on adjoining mainland.

SUBSPECIES. Anthony's Vireo *Vireo huttoni obscurus* is the form accredited to the Canadian section of its range, but considerable doubt has recently been expressed as to the validity of this race. If it is thrown out as a recognizable subspecies, our bird will have to be recognized as the type form *Vireo huttoni huttoni.*

One of the most inconspicuous of our woodland birds. Its limited range, small numbers in Canada, combined with its retiring habits, keep it from being very well known by Canadian ornithologists. Alone among our Vireos it is practically resident wherever found, and does not migrate in winter to a noticeable extent.

FAMILY—COMPSOTHLYPIDAE. WOOD WARBLERS

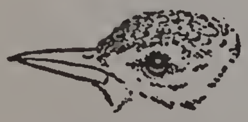


Figure 280
Bill of Tennessee Warbler; natural size.

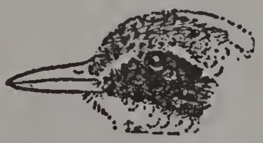


Figure 281
Bill of Myrtle Warbler; natural size.

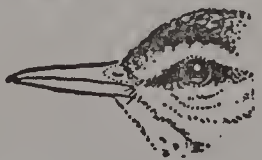


Figure 282
Bill of Water-thrush; natural size.

General Description. Small birds, only one Canadian species being over 6·28 inches long and very few over 5·75. They are usually bright-coloured woodland and treetop birds, though a few inhabit the ground and the grass. They are, as a family, difficult to diagnose and the genera may be most easily recognized by the bills (Figures 280, 281, 282), though considerable familarity with the species is necessary to recognize the generic characteristics.

Field Marks. No reliable field marks covering the whole family can be given. However, after a little experience with them their small size, bright colours, and sprightly actions are easily recognized. They are most likely to be confused with the Vireos, but *see* bill, Figure 277.

Nesting. The nesting habits of the family are various; some build in trees, near the ground or well up towards the taller tops, others on the ground or in grass, and some in holes in dead stubs.

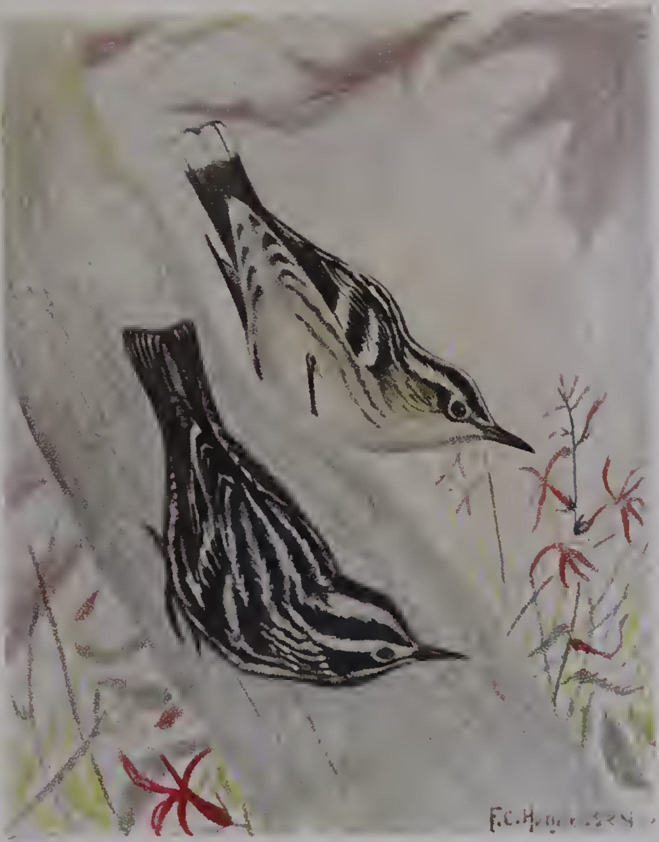
Distribution. Most of the Warblers breed in the northern spruce woods beyond the limits of general settlement. Some nest in the more cultivated sections and a few in our most southern sections. All are migratory and, according to species, spend the winter from northern United States south to the Amazon.

The American Wood Warblers constitute a large family peculiar to the Americas. In fact they divide the honours in point of number with the Sparrows. The Warblers are the delight of amateur bird-observers. So small that few but the enthusiast ever see them, but so numerous and brilliantly coloured that their discovery opens up a new world of interest to the novice. The sexes are usually dissimilar and there is considerable seasonal change in plumage. This, multiplied by the large numbers of species, makes the task of identifying all of them seem almost hopeless to the novice. It is not, however, as difficult as it seems at first. The spring males are usually distinctly marked and as many of them are furnished with descriptive names their differentiation is comparatively simple. As the females and autumn birds usually retain suggestions of the characteristic spring markings of the males the difficulty is really less than is generally anticipated. Of course, puzzling specimens occur which give even the experts some difficulty, but it is usually an alternative between two species which can be settled by giving attention to one or more small details. In studying the Warblers the observer is advised to become familiar with the spring males first. When the males of the common species are known, quite an easy matter with such strongly characterized forms, most of the females are recognized without much difficulty, as they usually carry a subdued reflection of their mate's brighter colour pattern. In the autumn, most juveniles resemble the females closely enough to make recognition easy. There are thus few plumages besides those of the spring males that have to be learned individually. The Canadian Warblers represent twelve genera, seven of which are represented by single species only. *Dendroica* has sixteen species, *Vermivora* five, and three others are represented by three species each. The generic details of the most important will be discussed under their proper headings.

Though called "Warblers" their song should, as a rule, hardly be dignified by such a term. With few exceptions the songs are only insignificant little notes without much prolonged continuity, but as they are often specifically distinctive the student is advised to pay close attention to them, for when the great Warbler migrations are on, the presence of a new or rare species is often first made known by a single unfamiliar sound directing attention from the many to the one that would otherwise escape notice.

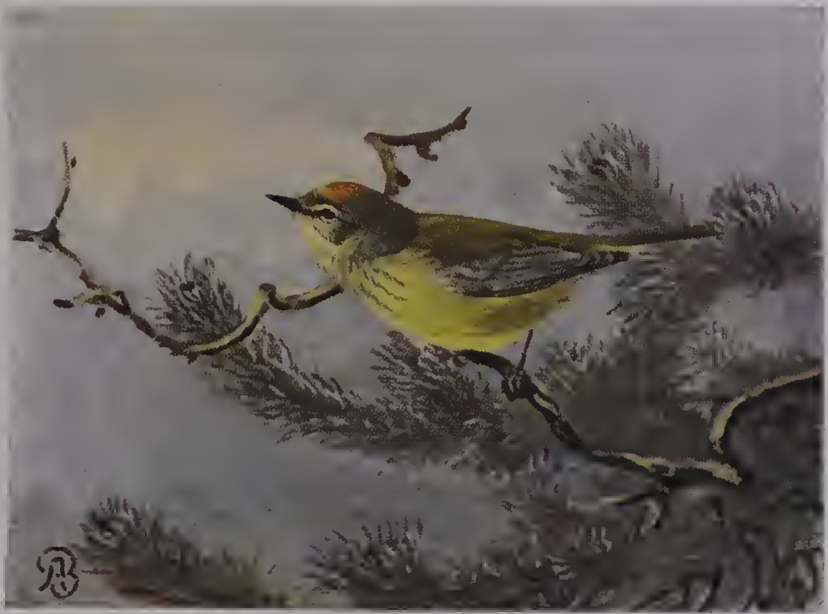
Economic Status. The Warblers are highly insectivorous. A few take seed, and a little fruit that is almost invariably wild, and no complaints have been made against any of the family. Their effect, therefore, is wholly beneficial. Being active, they reach all kinds of insect habitats from axils of highest flung leaves to between blades of grass on the ground, and as they are small, they are satisfied with insects and insect eggs that

PLATE LXVIII



A. Black and White Warbler; scale, $\frac{3}{5}$

Spring Autumn



B. Orange-crowned Warbler; scale, $\frac{1}{3}$

are too insignificant or too well hidden to receive the attention of larger birds.

CREEPING WARBLERS

There is but one genus and one species of this group within our domains and it is so well characterized by habit and coloration as to be recognized at sight.

636. **Black and White Warbler.** BLACK AND WHITE CREEPER. *Mniotilta varia.* L, 5·30. Plate LXVIII A. A sharply striped black and white Warbler of pronounced creeping habits.

Distinctions. With its strong black and white striping, most likely to be confused with the spring Black-polled Warbler. Besides smaller size, more intense contrasts of black and white, and creeping Woodpecker habits, its crown with a white median stripe instead of being solid black will separate it easily from that species in the spring. In the autumn, the two birds are quite different. Autumn and spring adult Black and White Warblers are practically alike, but juveniles are slightly overwashed with buff and have less black on the throat. On the southern coast of British Columbia where the Black and White is not known to occur, is another black and white coloured Warbler, the Black-throated Grey Warbler, that bears a general resemblance to it (*See* page 322).

Field Marks. Strong black and white striped coloration and median crown stripe. Creeping habits like a Woodpecker. It is the only black and white Warbler to be seen in autumn east of the southern British Columbia coast.

Nesting. On the ground, at the base of stump, log, or rock, in nest of strips of bark, grasses, etc., lined with rootlets and long hair.

Distribution. Eastern North America and northern South America. In Canada, across the Dominion to the foothills, north into Mackenzie valley, breeding in the northern wooded sections.

This is one of the first Warblers to arrive in the spring and one of the easiest to identify at any time as it is always well marked and there is little difference in seasonal or sexual coloration.

WORM-EATING WARBLERS

The genera *Vermivora* and *Composthlypis* may be roughly grouped under this title. They are small, slightly built Warblers. Their bills are small, sharply pointed, almost spine-like with the culmen straight, rather than convex or slightly arched (Figures 283-286).

642. **Golden-winged Warbler.** *Vermivora chrysoptera.* L, 5·10. A blue-grey Warbler. Male: white or very light grey below, darkening on the flanks, with yellow cap and wing patch and black cheeks and throat (Figure 283). Female: similar to male, but somewhat reduced in brightness and the blacks represented by dark grey. There is little age or seasonal plumage variation.

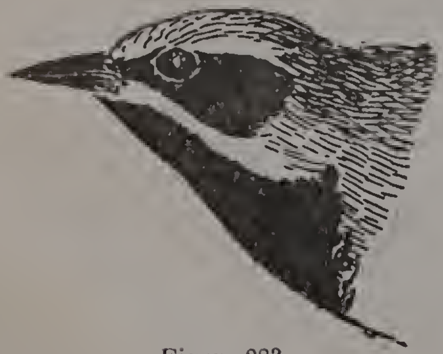


Figure 283
Golden-winged Warbler (male); natural size.

Distinctions. The blue-grey body, yellow wing patch, and black throat and eye patches are distinctive.

Field Marks. The above marks are easily recognizable in life. The black throat somewhat suggests the Chickadee, but the other marks make it easy to separate them.

Nesting. On the ground or in bushy fields or second growth in nest much like that of the Blue-winged Warbler.

Distribution. Eastern North America. In Canada of regular occurrence only in a small area in southern Ontario. Reported twice from southern Manitoba.

645. **Nashville Warbler** (Including **Calaveras Warbler**). RED-CAPPED WARBLER. *Vermivora ruficapilla.* L, 4·77. A yellow and green Warbler with a greyish head and a more or less concealed chestnut crown-patch (Figure 284). Sex, season, and age plumages varying only in intensity of yellow and the amount of chestnut in cap. In females, the cap may be entirely concealed by the grey edgings of the feathers and occasionally it may be altogether absent.

Distinctions. The unmarked green above and yellow all below to tail, but brightest on throat and breast; and the grey or greyish head and cheeks are distinctive. This greyish head and hindneck may not be marked, but is always present as a slight differentiation from the green back. When present the chestnut crown (not orange-rufous as in the Orange-crowned Warbler) is an unmistakable specific character.

Field Marks. Bright yellow, unstreaked underparts and grey head and cheeks.

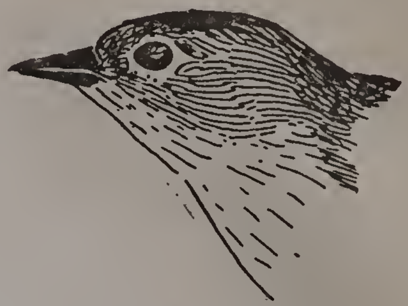


Figure 284
Nashville Warbler (male); natural size.

Nesting. On the ground in partial clearings or tree-grown pastures, in nest of grasses and moss lined with finer grasses and fine rootlets.

Distribution. North America. In Canada, practically across the Dominion, common in Manitoba and southern British Columbia, but rare in the intervening region. Has been taken as far north as Great Slave lake.

SUBSPECIES. The eastern and western representatives of this species are subspecifically distinct. The eastern Nashville Warbler *Vermivora ruficapilla ruficapilla* occurs west to Alberta. The Calaveras Warbler *Vermivora ruficapilla gutturalis* is the form occurring in southern British Columbia. It shows perceptibly brighter yellow below and on rump.

This Warbler is most likely to be found in open shrubbery and small growth along streams.

646. **Orange-crowned Warbler** (Including **Lutescent Warbler**). *Vermivora celata.* L, 5. (Plate LXVIII B). A dull yellowish, grey-green Warbler, mostly yellow below, with a concealed orange-rufous crown patch. Very little sexual difference. Immatures are without the crown-spot, and the brightness of the yellow below is reduced to almost the colour of the back.

Distinctions. Similar to the Nashville but without the grey or greyish on the head. The crown-spot when present is still more concealed than that of the Nashville and often entirely hidden until the feathers are separated to show their coloured bases. The yellow throat is duller than in the Nashville. The juvenile is an almost evenly greyish-green bird with faint suggestions of ashy and rather similar to the immature Tennessee but without the faint, light eyebrow-line; it is more evenly coloured, and without any suggestion of white below (compare with Figures 284, 285).

Field Marks. Like a very dull-coloured Nashville Warbler or a juvenile Tennessee without the faint eyebrow-line.

Nesting. On or near the ground in nest of leaves and fine grasses.

Distribution. North America. In Canada, rare east of the Great Lakes, but common throughout the west as far north as the limit of trees.

SUBSPECIES. Two subspecies in Canada are recognized by the Check-list. The Eastern Orange-crowned *Vermivora celata celata* extends west to the east slope of the mountains. In British Columbia occurs the Lutescent Warbler *Vermivora celata lutescens,* a bird that shows considerably more yellow, especially the juvenile. A third form, *Vermivora celata orestera,* rather intermediate between these two, has been postulated for the mountain interior and has received some recognition.

647. **Tennessee Warbler.** *Vermivora peregrina.* L, 5. Back of male green, underparts nearly pure white. Head and hindneck ash-grey, suffusing on cheeks. White eyebrow-line and suggestion of dark line through eye (Figure 285). Females and juveniles have the grey head and hindneck replaced by the green of the back which suffuses more

or less as dull yellow or greenish yellow over breast and underparts. The eyebrow-line is always visible as a lighter coloration of the green.

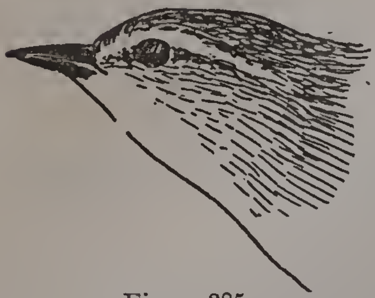


Figure 285
Tennessee Warbler (male); natural size.

Distinctions. The general green and white coloration and light eyebrow-line are the best distinctions in any plumage.

Field Marks. General coloration as above, with light eyebrow-line and without wing-bars, tail patches, or the whitish spot at base of primaries of the Black-throated Blue Warbler.

Nesting. In moss on the ground in small, dense, coniferous growth, in nest of fine grass, rootlets, and long hairs.

Distribution. Eastern North America. In Canada, across the Dominion, to the eastern slope of the mountains, north to the limit of trees. Occurs and breeds in northern British Columbia.

648. **Parula Warbler.** BLUE YELLOW-BACKED WARBLER. *Compsothlypis americana.* L, 4·73. Above and sides of face and neck blue, almost bright blue, with yellow suffusion over middle of back. Below, white, throat and breast clear yellow, with a vaguely defined black (or bluish black), and rufous band across breast (Figure 286). Females and juveniles are duller, without the breast-band, and with the yellow more or less suffused over all upperparts, but strongest in middle of back. White wing-bars in all plumages.

Distinctions. The blue back, either pure or overwashed with yellow, wing-bars, and yellow breast and throat are always distinctive.

Field Marks. See just above.

Nesting. In bunches of *Usnea* (Old-man's-beard) or other hanging lichens.

Distribution. Eastern North America. In Canada, west regularly to the Great Lakes. Has been taken occasionally in southern Manitoba.

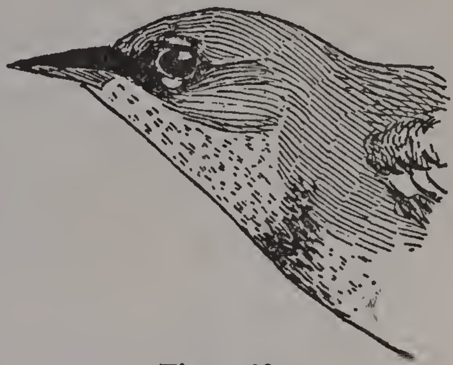


Figure 286
Parula Warbler (male); natural size.

SUBSPECIES. The form recognized in Canada is the Northern Parula Warbler *Compsothlypis americana pusilla.*

WOODLAND WARBLERS

The Genus *Dendroica* is composed of Warblers of slightly sturdier build than the Worm-eating Warblers. The bill is somewhat longer and the culmen more decidedly arched (Figures 287-295). The tail except in the Yellow Warbler always contains a considerable amount of white.

650. **Cape May Warbler.** *Dendroica tigrina.* L, 5. Male: throat, breast, and most of underparts bright yellow, finely and sharply striped with black on lower throat, breast, and flanks. A chestnut patch in the middle of the cheek cuts sharply against the yellow (Figure 287). Top of head black continuing as elongated spots on the yellow-green of back. The rump is yellow and the wing has a large white patch. Female: olive-grey above, dirty white below warmed with yellow suffusion across breast which is faintly striped with dark. Rump yellowish, and white wing patch replaced with vague bars. Juvenile: similar to spring birds but less bright; male, without chestnut cheeks. Females: even, dull olive-grey, slightly yellow on rump; dull white slightly olive below, faintly streaked with soft, dark lines, and with faint washes of yellowish olive on breast and flanks.

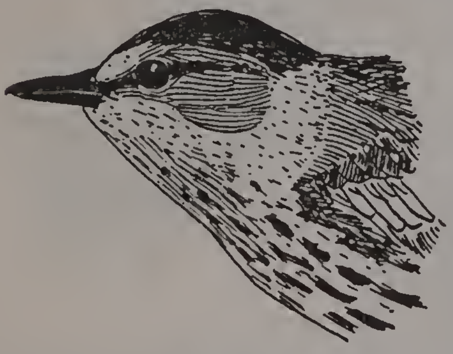


Figure 287
Cape May Warbler (male); natural size.

Distinctions. Males are distinctive with their tiger-like colours of yellow with black stripings. Adult females show enough of the male's pattern to be recognizable. Juvenile females are more difficult to recognize. However, all show at least an appreciable yellowness on the basal parts of the feathers on the sides of the neck just behind the ears. This slight tinge sometimes shows in life when the bird turns its head, but with the bird in the hand the feathers must be separated to show it.

Field Marks. Adults and juvenile males are distinctive. Juvenile females may be recognized by the peculiar, fine, dim striping of breast against a slightly buffy, light olive-grey ground or by the concealed yellow spot on sides of the neck as described above.

Nesting. On low branches in small trees in pastures or woodlands in partly pensile nest of twigs and grasses fastened together with spider-web and lined with horsehair.

Distribution. Eastern North America. In Canada, west regularly to Manitoba, occasionally to central Saskatchewan. Has been taken as far north as Mackenzie valley.

652. **Yellow Warbler.** SUMMER YELLOW-BIRD. *Dendroica aestiva.* L, 5·10. Plate LXIX A. Male: bright yellow, greening slightly on back, with fine rufous stripes across breast and along flanks. Females and juveniles are similar but duller and without breast stripes, and in some specimens almost more generally green than yellow.

Distinctions. Practically the only all-yellow Warbler. Some specimens of Orange-crowned, Nashville, Wilson's, or other Warblers may approach occasional Yellow Warblers in colour, but none of them have the inner webs of the tail feathers distinctly yellow as has this species.

Field Marks. The even and uniform bright yellow of spring birds is unmistakable. Some females are more green than yellow, but the green-edged wings and yellow tail, lack of colour contrasts, size, and actions of the bird are easily recognized.

Nesting. In an upright crotch in bushes and small trees in nest of fine fibres and a large amount of plant down, lined with plant down and sometimes long hairs.

The Yellow Warbler is one of the few species that sometimes refuses to incubate Cowbirds eggs. Instead of throwing out the intruding egg, however, it builds a new nest over the old one, burying it and its entire contents, including often some of its own eggs, in the foundation of the new structure, in which another set of eggs is deposited.

Distribution. North and South America. In Canada, across the Dominion north to the limit of trees.

SUBSPECIES. Two races are recognized in Canada. The Eastern Yellow Warbler *Dendroica aestiva aestiva* west to the Pacific slope. On the west coast the Alaska Yellow Warbler *Dendroica aestiva rubiginosa* is the accredited form. It is slightly more olive on the back and the breast stripes may be slightly fewer and less decided, but the distinctions are so fine that it is difficult to delimit the ranges of the two.

This is the commonest breeding Warbler in southern Canada. It shares with the Goldfinch the popular name of Wild Canary, but the lack of black anywhere will determine it at a glance. It is found in shrubby localities in open country or along stream or marsh edges. It is a common visitor to the garden and its cheery little song is very pleasing. In the autumn the Yellow Warbler is one of the first species to leave.

654. **Black-throated Blue Warbler.** *Dendroica caerulescens.* L, 5·28. Male: deep blue above from crown to tail-coverts; below, white; cheeks, throat, foreneck, and flanks black (Figure 288). Female: dull, dark, olive all above, lightening on throat, breast, and abdomen to dull olivaceous-cream. White spot at base of primaries in all plumages.

Distinctions. The male, so descriptively named and strongly marked, is very distinctive. The female, however, especially in autumn, is more difficult to distinguish; it may resemble either the juvenile of the Tennessee, the autumn Black-poll, or the Bay-breast. The streaked back and wing-bars, however, of the two last are absent. It is darker and more greyish green than the Tennessee above and more buffy below. An indistinct and partly concealed white or light spot at the base of the primaries is always diagnostic of females of this species.

Field Marks. The male is distinctive. The female in any plumage can usually be recognized from all other evenly coloured dull green Warblers by the sometimes very faint light spot at the base of the primaries, which shows more conspicuously in life than might be expected.

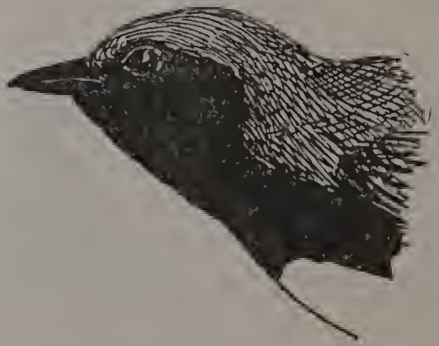
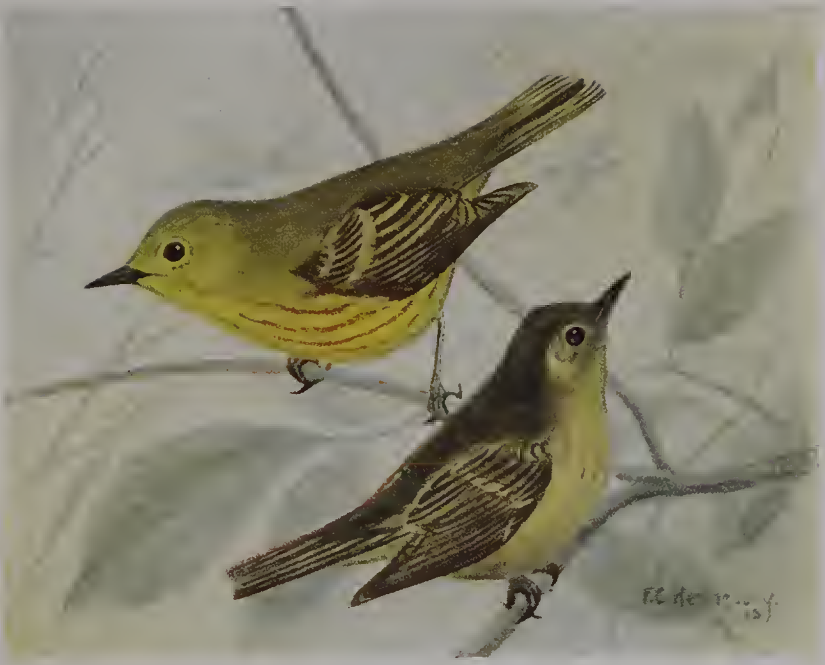


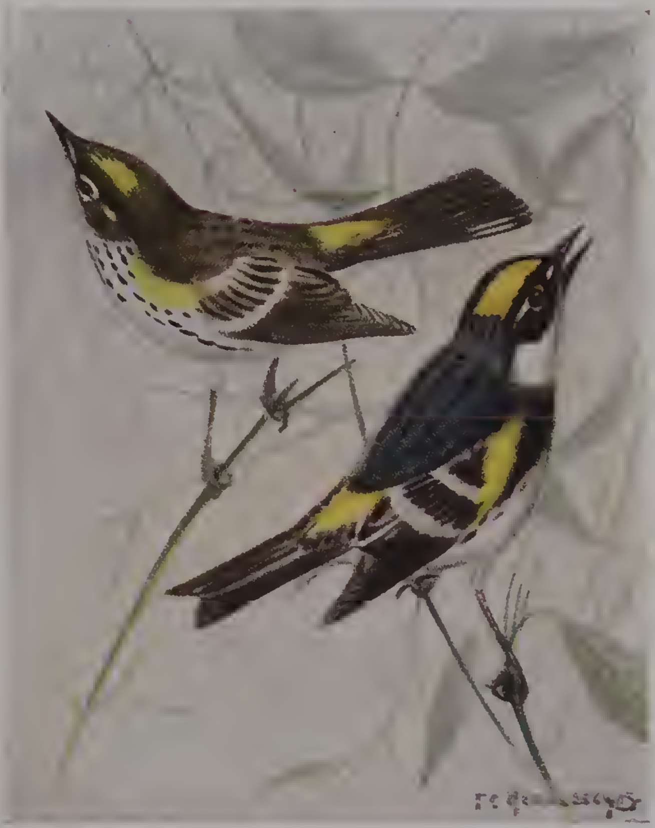
Figure 288

Black-throated Blue Warbler (male); natural size.

Plate LXIX



A. Yellow Warbler; scale, ½
Male Female



B. Myrtle Warbler; scale, ½
Female Male

Distribution. Eastern North America. In Canada, common east of the Great Lakes. Reported on two occasions from eastern and southern Manitoba.

SUBSPECIES. The subspecies accredited to Canada is the Northern Black-throated Blue *Dendroica caerulescens caerulescens.*

655. **Myrtle Warbler** (Including **Hoover's Warbler**). YELLOW-RUMPED WARBLER. *Dendroica coronata.* L, 5·65. Plate LXIX B. Male: slaty blue above; white on throat and below. A broad black breast-band extending brokenly along flanks; spot on crown; rump and patches between flank and breast lemon yellow. Female: the same but duller, the black less pure and the blue clouded with buffy rust. Juveniles: similar in general, but back very rusty, breast dirty white with fine dark streaks, but with the yellow marks as above always more or less evident.

Distinctions. Except within the range of Audubon's Warbler unmistakably recognized by the characters above. The species differs from Audubon's Warbler only in having a white instead of a yellow throat (compare with Plate LXX A). Young birds of the latter species may be very difficult to separate from the Myrtle, but there is almost always some trace of yellow on the throat. When this trace is absent, as occasionally happens, it is perhaps impossible to distinguish them as no character is absolutely constant.

Field Marks. The yellow rump is always distinct and bright and makes a most conspicuous field mark. The throat being white instead of yellow will, when observed, separate the Myrtle from Audubon's Warbler.

Nesting. In coniferous trees; in nest of vegetable fibre lined with grasses.

Distribution. North America except the western States. In Canada across the Dominion and into Alaska, north to the tree limit. Less common in British Columbia than farther east.

SUBSPECIES. The form occupying eastern Canada to Alberta is the Eastern Myrtle Warbler *Dendroica coronata coronata.* The northwestern bird from Alaska to the Mackenzie and central British Columbia is Hoover's Warbler *Dendroica coronata hooveri,* stated to be slightly larger and to have slight colour differences. An early Warbler to arrive in spring and late to depart in autumn.

One of the most conspicuous and most characteristic Warblers in migration time. Sometimes, especially in the autumn when the majority of other small birds have gone, the bushy wastes and weedy roadsides will be swarming with Myrtle Warblers, each showing its bright rump spot and giving voice to a metallic little cheep in proof of identity as it darts away.

656. **Audubon's Warbler** *Dendroica auduboni.* L, 5·65. Plate LXX A. Like the Myrtle Warbler, but with a yellow instead of white throat. Young birds may not show a completely yellow throat, but it is unusual when some yellow is not indicated.

Distinctions. With its distinctive coloration, expecially the contrastive yellow rump, mistakable for no other species than the Myrtle Warbler (compare with Plate LXIX B). Occasional young birds without the yellow throat are practically indistinguishable from that species, but in the majority of specimens enough yellow is suggested for the recognition of the species.

Field Marks. The yellow rump is always distinct and bright and makes a conspicuous field mark to separate the species from all other but the Myrtle. Separated from that species by yellow instead of white throat.

Nesting. Usually in coniferous trees. Nest of strips of bark, pine needles, lined with fine roots and grasses.

Distribution. Western North America. In Canada, east to the Alberta foothills, occasionally to Saskatchewan, north to central British Columbia.

SUBSPECIES. The only subspecies formally recognized in Canada is the northern one, *Dendroica auduboni auduboni.*

A species so like the Myrtle in habits and action as to require no separate discussion.

657. **Magnolia Warbler.** BLACK AND YELLOW WARBLER. *Dendroica magnolia.* L, 5·12. Plate LXX B. Male: above, mostly blue-grey, clear on crown but with a black saddle and yellow rump; below, to near tail-coverts, bright yellow, with a broken breast-band of black, continuing down the flanks in stripes. Face and cheeks black, bordered by thin white line above. Female: similar, but with details subdued and softened. Autumn birds are dull grey on crown, shaded with green on back, changing to yellow on rump, all below clear yellow with flank stripes but faintly suggested or absent.

Distinctions. The bright yellow breast and underparts distinctly striped with black; black cheeks; greyish upperparts and yellow rump are quite distinctive in spring. The Magnolia Warbler has a general resemblance to the Canadian and to Townsend's Warbler. Distinguished from the Canadian by the yellow rump and from Townsend's by absence of yellow eyebrow. In autumn it still retains veiled suggestions of spring plumage, but the breast and flank markings are reduced or absent; the head and face evenly greyish and the back greyish shaded with green.

Field Marks. The yellow below and on rump will separate the Magnolia from all Warblers but the Cape May. The latter's yellow breast is sharply and more evenly striped with black and it has the chestnut ear patch. It may also be suggested by Townsend's Warbler (Plate LXXI A), but it never has a black throat or yellow eyebrow and the rump is always yellow. Close examination of the Magnolia in autumn plumage always shows a vague, light ashy bar across the upper breast. The tail is also a good identification mark. The characteristic white marking of the tail is well back from the tip and rather extensive, giving, when seen from below, the appearance of a white tail broadly banded with black.

Nesting. In coniferous trees 3 to 6 feet from the ground in nest of fine twigs and leaf stems lined with hairlike rootlets.

Distribution. Eastern North America. In Canada, across the Dominion to the eastern slope of the mountains, occasionally in interior and northern districts of British Columbia, but never to the coast; north to Mackenzie valley.

658. **Cerulean Warbler.** *Dendroica cerulea.* L, 4·50. Male: all sky blue and white. Above, all blue with fine black markings on back and sides of crown (Figure 289). Below, pure white with blue breast-band and flank-stripes; wing-bars white. Female: even, dull greenish blue above; white below, more or less stained with suggestions of greenish and yellow. Juvenile similar to female but yellower all over.

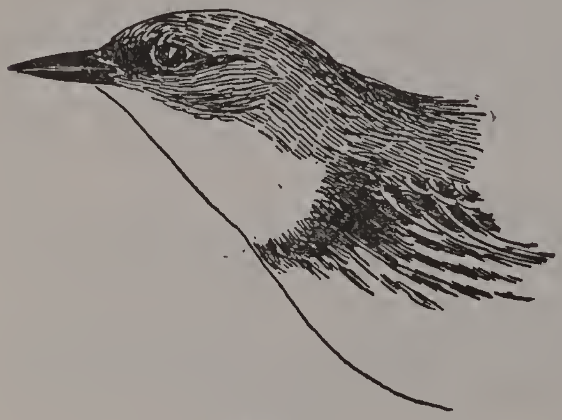


Figure 289
Cerulean Warbler (male); natural size.

Distinctions. The male is unmistakable. Other plumages have a peculiar bluish green, instead of olive or yellowish green like other species, that is quite characteristic. The juvenile with its yellow-greenish underparts and eye-stripe somewhat similar to the young Tennessee Warbler (Figure 285), but its white wing-bars and tail patches will at once separate it from that species.

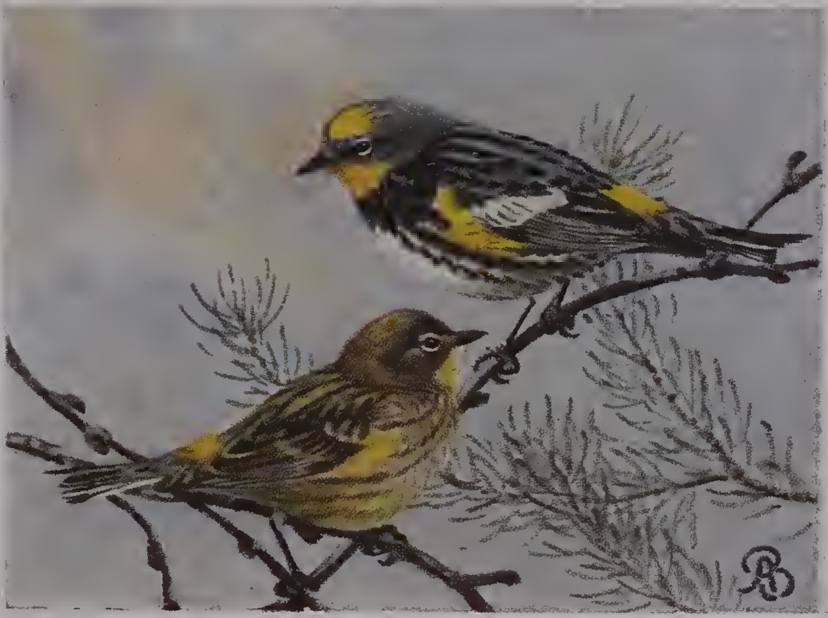
Field Marks. All blue and white of the male and the decided bluish sheen of other plumages. Otherwise like a Tennessee Warbler, but with white wing-bars and white in tail.

Nesting. In tree 20 to 60 feet above ground in nest of fine fibres bound with spider's web, lined with strips of bark with a few lichens on outer surface.

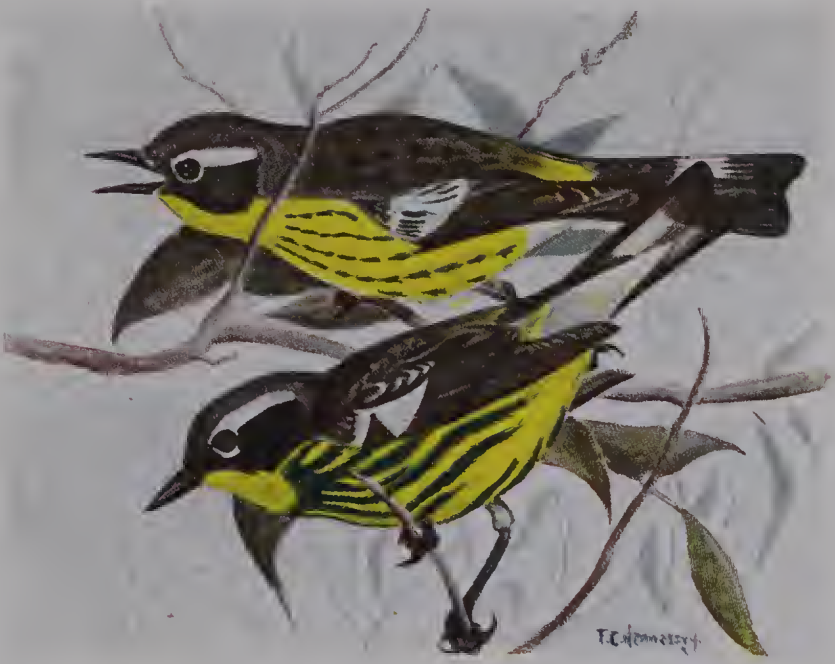
Distribution. Eastern United States except coast area; north to southern Ontario. One specimen has been taken in southern Manitoba, forming the only record for western Canada.

659. **Chestnut-sided Warbler.** *Dendroica pensylvanica.* L, 5·14. Male: crown yellow (Figure 290); back black and grey in stripes, overwashed with yellowish green; below white with chestnut bands along flanks; two white or yellowish wing-bars. Juvenile an almost even yellowish green above, white below, cheeks grey; usually with suggestions of the chestnut sides of the male.

Plate LXX



A. Audubon's Warbler; scale, $\frac{1}{3}$
Autumn Spring



B. Magnolia Warbler; scale, $\frac{1}{2}$
Female
Male

Distinctions. Superficial attention to the above description might confuse this species with the Bay-breasted, but the white throat and cheeks are distinctive (Compare with Figure 291). Spring birds with their yellow cap, chestnut sides, and white underparts; and autumn ones white below, yellowish green above, and yellowish wing-bars are easily recognized.

Field Marks. The white underparts and peculiar lemon-yellowness of the green above are good recognition marks even in plumages where the characteristic markings do not show.

Nesting. In bushes some 3 feet from the ground in nest of strips of bark, leaf stems, etc., lined with tendrils and rootlets.

Distribution. Eastern North America. In Canada, west to Manitoba and parts of northern Saskatchewan.

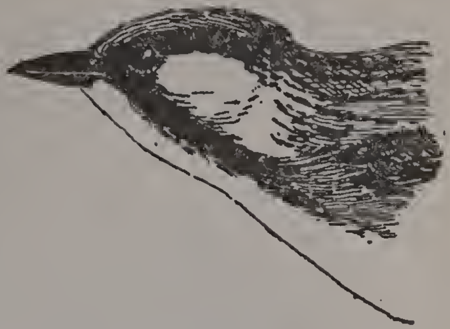


Figure 290
Chestnut-sided Warbler (male); natural size.

660. **Bay-breasted Warbler.** *Dendroica castanea.* L, 5·63. Male: finely striped with dull olive-ochre and black above; underparts white; top of head, throat, foreneck, and flanks bay colour (reddish chestnut); forehead and cheeks black; a light ochre spot on side of neck (Figure 291). Female has all these characteristic marks, veiled and dimly indicated, but obvious enough for recognition. The autumn birds, however, are entirely different; above, yellowish green faintly striped with dark; below, white, more or less tinged with yellowish or buffy greenish; the bay of the sides is often indicated by a slight ruddy warmth or by individual, fully coloured feathers.

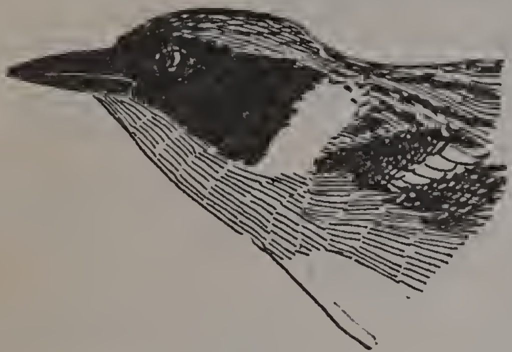


Figure 291
Bay-breasted Warbler (male); natural size.

Distinctions. Spring birds are distinctive enough. Autumn specimens resemble the juvenile Black-poll so closely that often they can be separated only with difficulty even when in the hand. The Bay-breasted almost invariably has a certain amount of warm ochre on the flanks which is lacking in the Black-poll and the undertail-coverts are cream instead of pure white. The presence of wing-bars will distinguish these two species from other plain greenish Warblers.

Field Marks. The adult male is distinctive in colour. The spring female always shows enough of the bay breast for recognition. Adult autumn birds usually have a trace of the bay on the flanks and the warm ochreish of these parts can generally be seen in juveniles. When these characters fail to distinguish the species, however, close attention will show that the breast colour is perfectly even and sharp eyes or good glasses will usually reveal very faint dark stripings showing on the sides of the breast of the Black-poll. None of these marks, however, can be seen except in the most favourable circumstances, but in mixed flocks one can usually tell the proportion of each species with fair accuracy.

Nesting. In coniferous trees, 5 to 20 feet above the ground, in nest of grasses and plant fibres lined with plant down and long hairs.

Distribution. Eastern North America. In Canada, west commonly to Manitoba, less frequently to Saskatchewan and occasionally to southeastern Alberta, northwest to lake Athabaska.

The Bay-breasted Warbler in spring migration prefers brushy growth in sandy wastes, roadsides, etc., but often comes close about the house plantation. The similarity of the autumn Bay-breasted and the autumn Black-poll, a bird in full plumage totally different, is one of the interesting phenomena of bird coloration. The autumn plumages of these two birds were at one time confused with each other under the name of Autumnal Warbler.

661. **Black-poll Warbler.** *Dendroica striata.* L, 5·56. Spring birds, black and white striped. Male with solidly black crown, and back striped with black and grey; below and cheeks white with series of stripes from base of bill, down sides of neck and along flanks (Figure 292). Female: dull greenish above, faintly striped; dull greenish-white below, with suggestion of striping like male. Autumn birds altogether different and almost indistinguishable from autumn Bay-breasts (*See* preceding species).

Distinctions. Spring male Black-polls with their clear black and white striping may be mistaken for no other bird within their regular range except the Black and White Warbler. Their non-creeping habits and crown solidly black instead of white, a white median line, easily identifies them. Spring females with their general greenish colour and suggestion of striping are also easily recognized. The Black-throated Grey Warbler of the extreme southwestern coast of British Columbia is a similar-appearing striped black and white bird, but the male has a black throat and all plumages have black, or almost black, cheeks (*See* Figure 293).

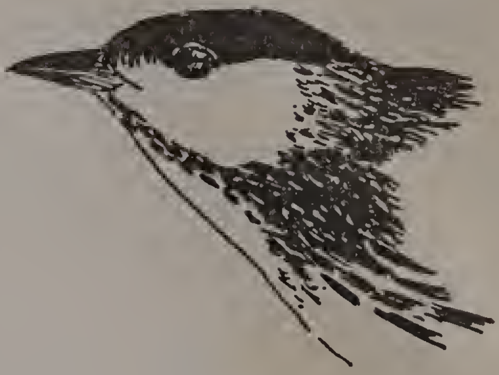


Figure 292
Black-poll Warbler (male); natural size.

Field Marks. Spring males are largely striped black and white, with solid black crown, and white cheeks and throat. The female is greenish, whiter below and more or less streaked with black on sides of throat and flanks. Autumn birds are olive-green above, with wing-bars of white; greenish-cream below, almost exactly like autumn Bay-breasts, but as a rule with very faint stripes, and visible only to sharp eyes and good glasses, showing through the yellowish of breast and flanks.

Nesting. Generally in spruce trees, in nest of twigs, mosses, rootlets, etc., lined with fine grasses and tendrils.

Distribution. North and South America. In Canada, across the Dominion, north to the limit of trees. Absent or scarce in southern British Columbia.

662. **Blackburnian Warbler.** *Dendroica fusca.* L, 5·25. Plate LXXI A. Spring male mostly black above and white below; clear black on head and cheeks; with bright orange breast, throat, eye-brow line, and median streak in crown. Female like male but much duller. Juveniles mostly dull greenish, lightening below much like autumn Black-poll and Bay-breasted Warblers.

Distinctions. Most specimens are unmistakable. Autumn females may be confused with autumn Black-polls and Bay-breasts, but the clearer yellow on throat, absence of greenish tinge below, and dark ear-coverts with conspicuous buff eye-brow line are diagnostic.

Field Marks. The bright orange or warm yellow confined to throat and breast and orange-yellow or buff eye-brow stripe in contrast with the dark cheeks and crown, make the best field marks.

Nesting. In coniferous trees in nest of fine twigs and grasses, lined with grasses and tendrils.

Distribution. Eastern North America. In Canada, west, including Manitoba. Occasional in Saskatchewan.

665. **Black-throated Grey Warbler.** *Dendroica nigrescens.* L, 5. A striped black and white Warbler; male, with solid black throat, cheeks, and crown, and a small lemon-yellow spot in front of the eye (Figure 293). Sexes and juveniles similar, but duller and lacking black throat partly or completely.

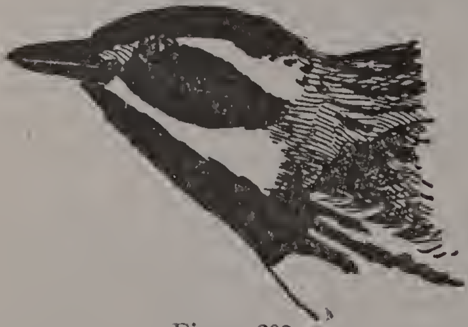


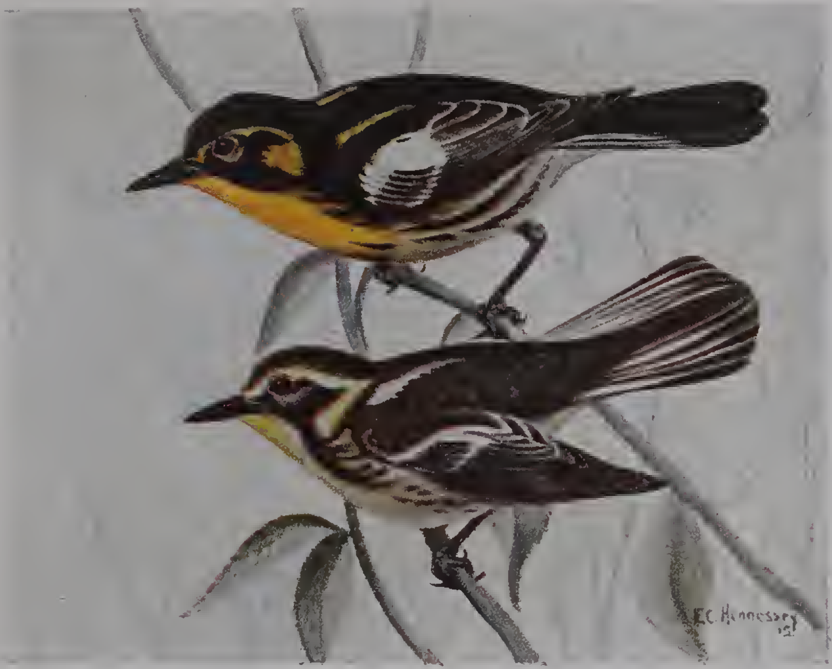
Figure 293
Black-throated Grey Warbler (male); natural size.

Distinctions. With black and white striping; to be confused only with the spring Black-poll or the Black and White Warbler, but not occurring within the regular range of either of them. Any black and white Warbler on the southern coast of British Columbia is probably this species.

Field Marks. A black and white streaked Warbler with solid black throat, cheeks, and crown.

Nesting. In low thicket or high pines. Nest of bleached plant fibres lined with feathers.

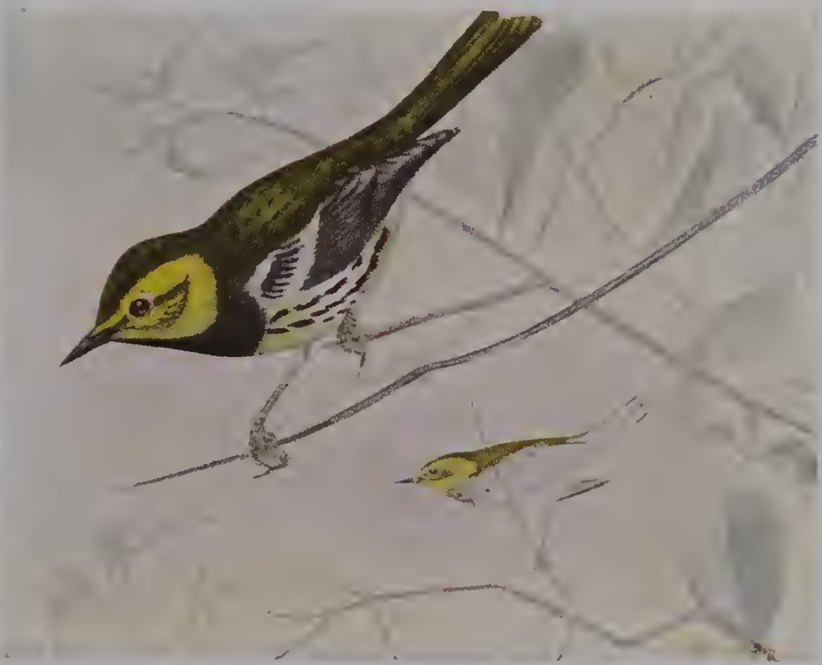
Distribution. Western North America. In Canada only in southwestern British Columbia, lower Fraser valley, and adjoining areas.



A. Blackburnian Warbler; scale, ½

Male

Female



B. Black-throated Green Warbler; scale, ½

Male Female

667. **Black-throated Green Warbler.** *Dendroica virens.* L, 5·10. Plate LXXI B. A green-backed, golden-faced Warbler, white below, with full black throat and breast. Females have the black throat broken and juveniles may lack it entirely.

Distinctions. Adults with golden face and black front are unmistakable. Juveniles, without the black throat are distinguished by their whiteness below and almost solid golden face.

Field Marks. Adults, black throat and breast contrasting with yellow face. Juveniles, green back, yellow cheeks, and white below.

Nesting. In coniferous trees in nest of small twigs and moss lined with rootlets, fine grasses, and tendrils.

Distribution. North America. In Canada, west to the east slope of the mountains and north to lake Athabaska.

668. **Townsend's Warbler.** *Dendroica townsendi.* L, 5. Plate LXXII A. Male: a contrastive yellow and black Warbler. Breast and face marks bright yellow. Crown, cheeks, throat, breast, and flanks, black. Females, or juveniles similar but duller and the black of throat veiled or absent.

Distinctions. Not likely to be confused with any other species except when it straggles east of the mountains. It may have a general resemblance to the Magnolia, Blackburnian, or Black-throated Green Warblers. The black throat, when present, separates it from the first two; the yellow eyebrow-line and black crown, further differentiate it from the Magnolia; the conspicuous bright, instead of subdued, yellow face marks, and breast, from the Blackburnian; and the dark cheeks and crown, from the Black-throated Green.

Field Marks. A dark Warbler with bright yellow breast and face marks; black crown, cheeks, and flank stripes, and, in adult male, black throat.

Nesting. In willows, nest of rotten plant fibres and roots, lined with rootlets, hair, and plant down.

Distribution. Western North America. In Canada, British Columbia north to the Yukon, east to the Alberta foothills, and casually beyond.

671. **Pine Warbler.** *Dendroica vigorsi.* L, 5·52. A dull green Warbler, the green changing to dull yellow on throat and breast (Figure 294), with greyish or brownish wings and tail, and faintly white wing-bars; in high plumage rarely becoming fairly bright yellow on throat and breast. There is little sexual or seasonal change.

Distinctions. Very similar to the Yellow-throated Vireo, but greener in colour and with the yellow below stronger and more extensive. The white abdomen is inconspicuous. The bill is lighter and warbler-like, instead of being stout, hooked, and of Vireo type (compare with Figure 277). From the Yellow Warbler it may be separated by its duller colour and the contrast between its wings and tail, and body. Its preference for pine trees is at least suggestive of its identity.

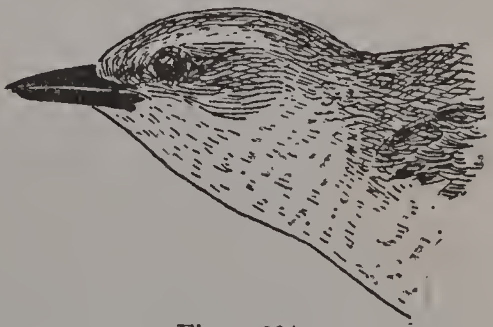


Figure 294
Pine Warbler (male); natural size.

Field Marks. A dull green Warbler, yellow on breast with greyish brown wings, white wing-bars. Canadian specimens are usually somewhat soiled and bedraggled in appearance. Almost invariably found in pine trees.

Nesting. In pine trees, 10 to 80 feet above the ground, in nest of strips of bark, leaves, plant fibres, etc.

Distribution. Eastern North America. In western Canada, rare or casual west to Alberta.

672. **Palm Warbler.** YELLOW RED-POLLED WARBLER. *Dendroica palmarum.* L, 5·25. A dull yellowish Warbler. Male: all underparts suffused yellow; cap reddish chestnut (Figure 295). The breast and flanks are streaked more or less with rufous, and a yellow eyebrow-line contrasts with dark cheeks and red cap. Females similar but colour subdued. Juveniles and autumn birds are greyish brown above; buff below with faint streaks, almost white on throat, and suffused with distinct yellow increasing to pure yellow on undertail-coverts. There is a blended yellowish rump-patch in all plumages.

Distinctions. The yellow underparts and red cap are unmistakable in all spring birds. In autumn the vaguely striped underparts, brown back, and yellow undertail-coverts are distinctive.

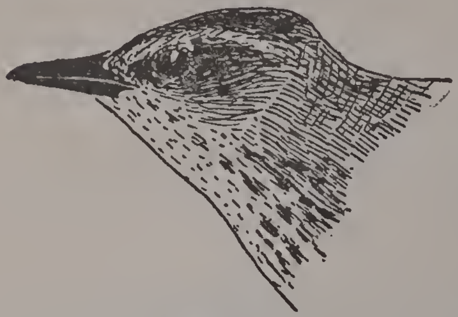


Figure 295
Palm Warbler (male); natural size.

The Nashville Warbler is the only other Warbler with a reddish cap, but it is pure yellow instead of only yellowish below and has no streaking anywhere.

Field Marks. The habitual, sandpiper-like upward jerk of the tail will distinguish this from other Warblers with yellow underparts. The bright yellow confined to the undertail-coverts, light throat, and vaguely striped buff breast of the juveniles will assist in separation of the species from comparable forms.

Nesting. On or near the ground in boggy ground or sphagnum barrens in nest of coarse grass lined with feathers.

Distribution. Eastern North America. In Canada, west to Manitoba, casually(?) to Alberta, and north to Mackenzie valley.

SUBSPECIES. The subspecies of Palm Warbler occurring in western Canada is the Interior Palm Warbler *Dendroica palmarum palmarum.*

WATER-THRUSHES OR WAG-TAIL WARBLERS

Birds of the genus *Seiurus* look more like Thrushes than Warblers, as is indicated by the popular names of Golden-crowned and Water-Thrushes that are sometimes given them. They are, however, true Warblers of woodland habits; ground birds, walking instead of hopping; of large size for Warblers; brown or dark olive coloration above, white below with the breast heavily streaked. Bills similar to those of the Warblers, the greater size of the bird being considered (Figure 282, page 313). They may be mistaken for Thrushes either in life or in the hand, but by attention to specific characters they can be easily distinguished.

674. **Oven-bird.** GOLDEN-CROWNED THRUSH. *Seiurus aurocapillus.* L, 6·17. Plate LXXII B. A large, thrush-like, ground-frequenting Warbler. Above, uniform olive brown, white below sharply and regularly streaked with dark brown across breast. A partly concealed median stripe or spot of dull yellow or old-gold between two brown lines on crown. All plumages alike.

Distinctions. The partly concealed dull golden crown patch bordered with brown will always determine this species.

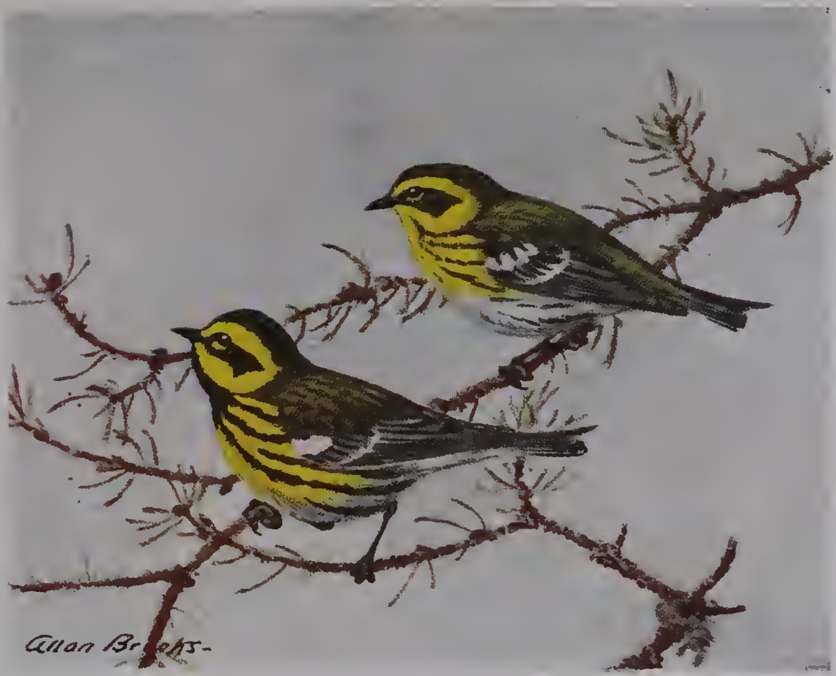
Field Marks. Though very thrush-like, there is generally little probability of actual confusion between this species and the Thrushes. Its pure white throat, foreneck, and underparts with little or no suffusion of other colour and the sharply contrasting stripes rather than spots of the breast are easily distinctive.

Nesting. On the ground, in a bulky structure of coarse grasses, weed stalks, leaves, and rootlets; covered over with leaves, and with the entrance at the side like an oven, giving the bird its specific name.

Distribution. North America. In Canada, west to the foot of the mountains; north to Great Slave lake.

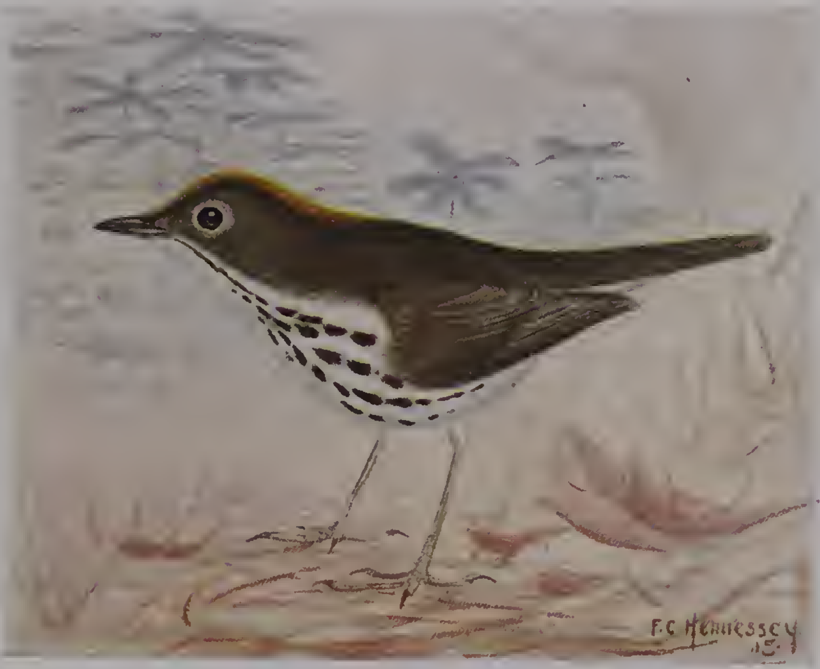
It is a woodland bird, usually common wherever open timber is interspersed in the heavier woods. Its common song *"Teacher—teacher—teacher—teacher"*, beginning low and ending very loud, is a familiar woodland sound and once heard will be remembered.

675. **Northern Water-Thrush** (Including **Grinnell's Water-Thrush**). WATER-THRUSH. *Seiurus noveboracensis.* L, 6·04. Dark olive-brown above, yellowish white finely and sharply streaked with dark below; disconnected lines on throat, breast, and flanks. A buffy blended line over the eye and a fine, sharp, dark one through it.



A. Townsend's Warbler; scale, $\frac{1}{3}$

Male Female



B. Oven-bird; scale, $\frac{1}{2}$

Distinction. Easily distinguished from the Ovenbird by its finer, more generally distributed striping and general yellowish colour below; its darker colour above (sooty brown rather than olive-brown); its decided face marks, especially strong superciliary line and the solid dark (nearly black) crown (Figure 296). From any of the true Thrushes it may be separated by its smaller size, darker, almost black, coloration above and yellowish below, and its distinct face marks. No true thrush has a distinct superciliary line or eye-bar.

Field Marks. The Water-Thrushes may be known by their thrush-like look, small size, and dark coloration and the habitual upward jerking of the tail (like some Sandpipers) as they walk or stand.

Nesting. On mossy bank or in turned-up roots of a tree, usually near or over water, in nest of moss lined with tendrils and fine rootlets.

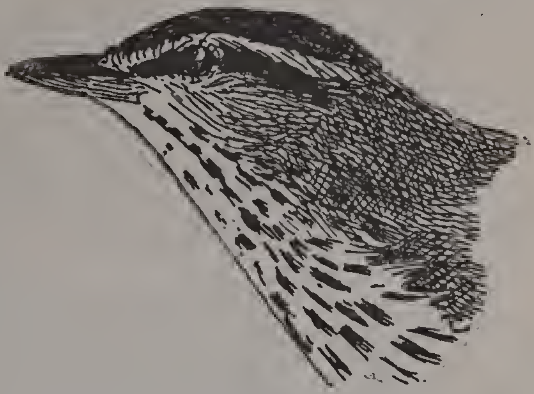


Figure 296
Northern Water-Thrush (male); natural size.

Distribution. North America. Across Canada, except southwestern British Columbia; north to tree limit.

SUBSPECIES. Two subspecies are recognized. The Eastern Water-Thrush *Seiurus noveboracensis noveboracensis* should not occur west of Ontario. Grinnell's Water-Thrush *Seiurus noveboracensis notabilis* is more sooty and less olive above; less yellow below; and should occupy the remainder of the specific range in Canada. The distinctions, however, are so fine that there is considerable difficulty in defining the ranges of the two forms and the ordinary observer can well disregard them.

The favourite haunt of the Water-Thrush is in wet cedar swamps or the thick undergrowth bordering woodland streams. Its voice is loud and clear and it has a weird, fascinating sound in admirable keeping with the mystery of its surroundings.

GROUND WARBLERS

The Ground Warblers are rather larger than the Woodland Warblers, but considerably smaller than the Wagtail Warblers and have comparatively stout legs and short wings. Their colours are largely green and bright yellow. They inhabit low shrubbery and are seldom seen far above the ground.

678. **Connecticut Warbler.** *Oporornis agilis.* L, 5·40. A greenish Warbler. Male: clear lemon-yellow below; face and throat to upper breast even bluish grey with a fine white eye-ring (Figure 297). The female is similar, but grey paler. Juveniles have the grey replaced by a lighter buffy shade of the back coloration.

Distinctions. This species is so like the Mourning and Macgillivray's Warblers that at times it can be separated only with difficulty. Adult males, having a conspicuous eye-ring and perfectly even grey throat and breast, are distinctive enough. Females may be told by the eye-ring and by having the top of the head strongly suffused with the olive of the back and not showing clear grey. Juveniles when they show the eye-ring are usually quite distinctive, though Mourning and Macgillivray's Warblers of similar age have an indication of it. When the eye-ring is not conclusive evidence, the difference in the colour of the throat and breast, a buffy olive instead of an even lightening and greying of the pure yellow below, is a good guide.

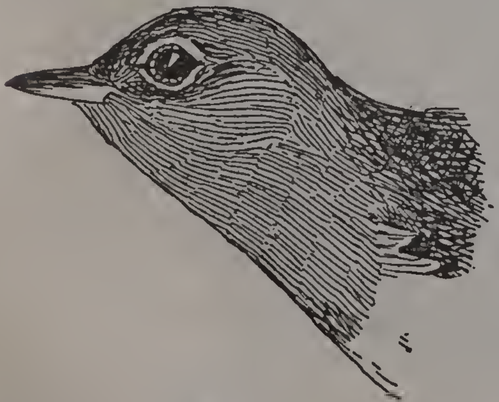


Figure 297
Connecticut Warbler (male); natura lsize.

The most conclusive distinction is, however, size; a bird with wing over 2·60 inches is undoubtedly this species.

Field Marks. The evenly grey throat and white eye-ring of adults and the buffy olive throat and buff eye-ring of the juveniles. Both this bird and the Mourning Warbler walk instead of hop.

Nesting. On the ground in nest of dry grass.

Distribution. Eastern North America. In Canada, southern Ontario and Manitoba west to northern Alberta.

One of the rarest of our Warblers. Its nest has seldom been found. It is very retiring and very local. It should be looked for on the ground in waste brush.

679. **Mourning Warbler.** *Oporornis philadelphia.* L, 5·63. A greenish Warbler. Male: clear lemon-yellow below; whole head, neck, and breast bluish grey with semi-concealed black spots on breast and throat giving a fancied resemblance to crape, which suggests the common name. The female is similar, but the grey lighter and without the crape markings on breast, thus resembling the male of the Connecticut. Juveniles have the grey of the crown, etc., replaced with the body green and the yellow of the underparts extends up neck to throat, slightly modified by lighter and greyish tinges.

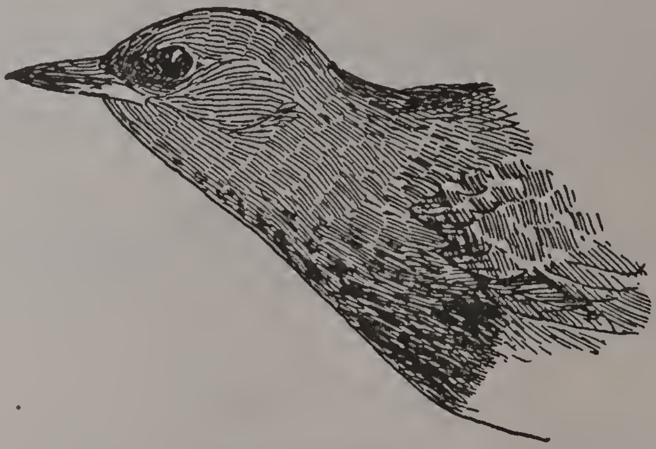


Figure 298
Mourning Warbler (male); natural size.

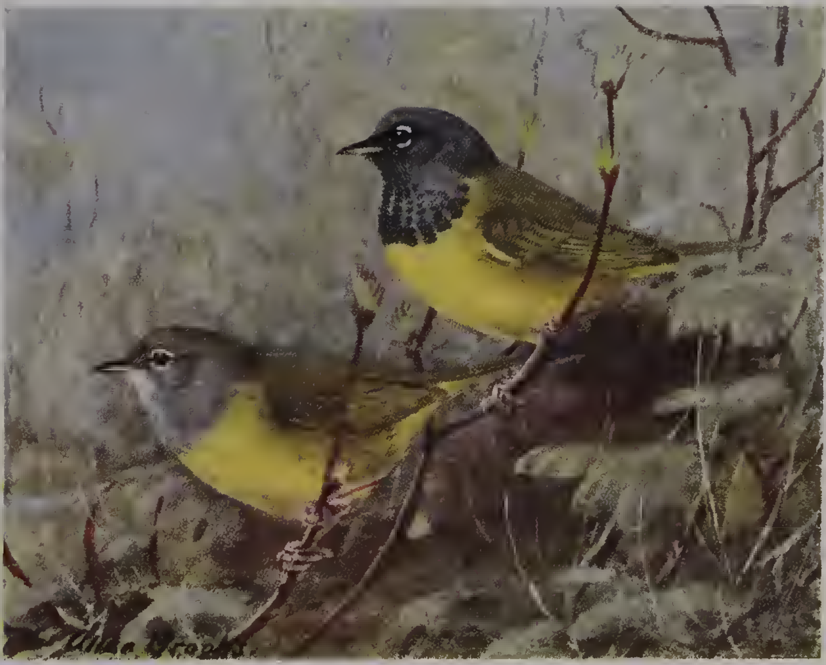
Distinctions. The Mourning Warbler is almost identical with Macgillivray's of the western prairie and mountain regions. Adult males are separable from it by the general even greyness of face without definite black in front of eye or white spots on the eyelids (Figure 298, compare with 299). Juveniles or females are often inseparable from that species. Somewhat similar to the Connecticut Warbler, adult males are separable from it by the crape-like black on the breast and the lack of white eye-ring (compare with Figure 297). Juveniles and females may have suggestions of eye-rings, but see that species for details. Any such bird with wing under 2·60 inches long is undoubtedly either Mourning or Macgillivray's, or perhaps Maryland Yellow-throat.

Field Marks. A green ground Warbler, bright yellow below with even grey head (no black on face or white on eyelids) and crape-like black across breast. For juveniles the large amount of bright yellow underparts right to undertail-coverts, and greyish head. This species, like Macgillivray's and the Connecticut Warblers, walks instead of hops. Some juveniles and females cannot be reliably separated from the above species in life.

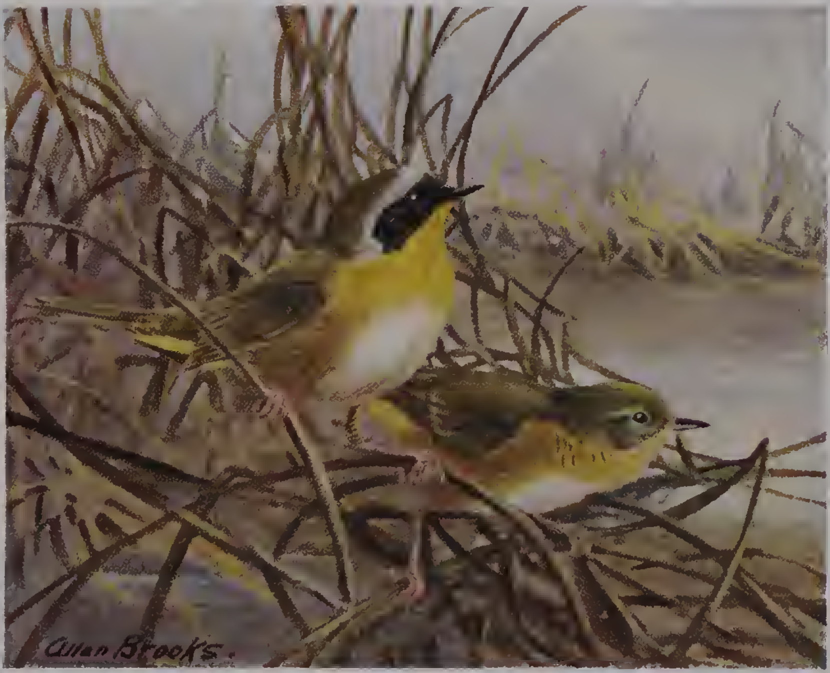
Nesting. On or near the ground in nest of strips of bark and other fibrous material, lined with hair.

Distribution. Eastern North America. In Canada across the Dominion west to the Alberta foothills; north to the dense spruce forest.

680. **Macgillivray's Warbler.** TOLMIE'S WARBLER. *Oporornis tolmiei.* L, 5·63. Plate LXXIII A. A greenish backed Warbler; bright lemon-yellow below back to undertail-coverts. Head, neck, and breast bluish grey with black in front of eye; a conspicuous white spot on either eyelid, and breast covered with semi-concealed and coalescing black


Allan Brooks.

A. Macgillivray's Warbler; scale, $\frac{1}{3}$
Female Male


Allan Brooks.

B. Maryland Yellowthroat; scale, $\frac{1}{3}$
Male Female

spots producing a fancied resemblance to crape as in the Mourning Warbler. The female is similar but duller and without the crape markings on breast or the black in front of eye. Juveniles have the grey of the crown, etc., replaced by the green of the body; and the yellow of the underparts extended up the neck to throat, slightly modified by lighter and greyish tinges.

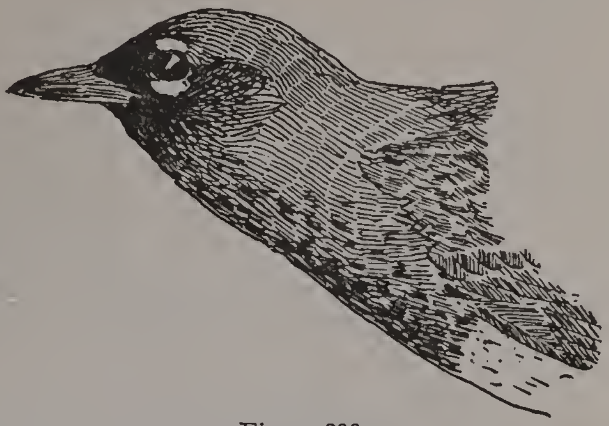


Figure 299
Macgillivray's Warbler (male); natural size.

Distinctions. Because of geographical range likely to be confused only with the Mourning Warbler. Adult male separated from it by black face and white eyelid markings (Figure 299, compare with 298). Females and juveniles may be indistinguishable from that species except in northern Alberta. Not likely to occur where the Connecticut Warbler does, but for distinctions see that species.

Field Marks. A green ground Warbler, bright yellow all below; grey head, black face, white spots on eyelid, and black crape markings on breast. For juveniles, the large amount of bright yellow all below and greyish head. This species, like the Mourning Warbler, walks instead of hops. Some females and juveniles cannot be reliably separated from that species in life.

Nesting. Near the ground in nest of dried grasses lined with finer grasses and sometimes horsehair.

Distribution. Western North America. In Canada, British Columbia east sometimes to Saskatchewan. Rather supplementary in range to the Mourning Warbler.

681. **Maryland Yellow-throat** (Including **Western** and **Pacific Yellow-throats**). *Geothlypis trichas.* L, 5·33. Plate LXXIII B. Male: a green-backed ground Warbler with bright lemon-yellow throat and a black mask over eyes and cheeks. Female: similar but duller and without black mask. Juvenile: still duller, the yellow on breast hardly apparent, ochre instead of lemon-yellow and all more or less overwashed with rusty.

Distinctions. The adult male with its black mask is easily recognized and needs no special characterization. Juvenile males have sufficient indications of the mask to be easily recognizable. Adult and juvenile females are very much alike. They may be recognized by their even coloration above, warm yellow throat, buffy white underparts washed with darker on flanks, and undertail-coverts yellowish. They are most likely to be mistaken for the Mourning, Macgillivray's, or Connecticut juveniles, but the sharp division between throat and cheek colours, the brightness of the throat, and the general warmer yellow tint will separate them. They have been confused with the Nashville and the Tennessee, but the grey rather than buffy or ruddy olive head and crown of the former and the nearly white breast instead of distinct yellow of the latter should make separation easy.

Field Marks. In addition to coloration, the marshy habitat, hiding habits, and characteristic actions of the Maryland Yellow-throat soon become familiar to the observer. Its scolding wren-like note is easily recognized.

Nesting. On or near the ground in bulky nest of strips of bark, coarse grasses, and dead leaves, lined with fine grasses, tendrils, and rootlets.

Distribution. North America. In Canada, across the Dominion, north to the edge of the northern spruce forest. In southern British Columbia.

SUBSPECIES. Three subspecies are recognized in Canada. The Northern Yellow-throat *Geothlypis trichas trichas* extends west to, and perhaps across, the Manitoba line. The Western Yellow-throat *Geothlypis trichas occidentalis* occupies the prairies, whereas the bird of British Columbia is supposed to be the Pacific Yellow-throat *Geothlypis trichas arizela.* The Western Yellow-throat is characterized mainly by having a broader white forehead line above the black mask. The Pacific Yellow-throat should be rather smaller and duller, but the distinctions are so fine that some doubt may be expressed as to their validity.

The particular haunts of the Maryland Yellow-throat are damp marshes where the wire-grass grows long and clumpy. It regards its immediate neighbourhood as its own particular property and vigorously resents intrusion. The usual song of the Yellow-throat is one of the characteristic sounds of the damp meadows. It has been poetically translated as "*Witchery—witchery—witchery,*" which gives a close approximation to it.

However, like many species of wide distribution, it seems subject to having local dialects just as the human language does. These are sometimes so different from what he has been accustomed to as to occasionally puzzle the observer who is perfectly familiar with the notes in other localities.

CHAT OR BRUSH WARBLER

The genus *Icteria,* composed of a single species, is the most un-warbler-like of the Warblers. The specific description following is sufficient diagnosis for the genus.

683. **Yellow-breasted Chat** (Including **Long-tailed Chat**). *Icteria virens.* L, 7·44. The largest and one of the least warbler-like of its family. All upperparts and cheeks green; lores black bordered above and below with white (Figure 300); throat to breast bright clear yellow; underparts white; bill comparatively shorter and stouter than that of any other Warbler.

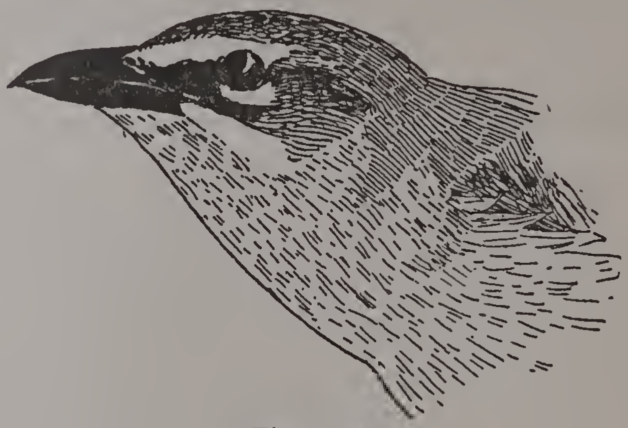


Figure 300
Chat; natural size.

Distinctions. Size is sufficient to distinguish the Chat at all times, but its colours are equally characteristic.

Field Marks. Large size, bright yellow foreparts, and black lores bordered above and below with white make striking field marks.

Nesting. In a crotch near the ground in rather bulky nest of coarse grasses, leaves, and strips of bark lined with finer grasses.

Distribution. United States. In Canada, the most southern parts of Ontario, close along the International Boundary in southwestern Saskatchewan, and the warm interior valleys of southern British Columbia.

SUBSPECIES. Two subspecies of the Chat are recognized in Canada. The Eastern or Short-tailed Chat *Icteria virens virens* is the Ontario form. The Long-tailed Chat *Icteria virens longicauda* has the tail averaging slightly longer, and shows some slight colour differences, especially in the white stripe from base of the lower mandible being larger and more pronounced. The distinctions, however, are too fine and too inconstant for general popular recognition. This latter, however, is the race to which our western birds should be referred.

The Chat, though rare in Canada, is a most interesting bird. It is the spirit of the tangled thickets and brushy wastes and like a spirit it comes and goes unseen, but not unheard. It laughs and cackles, whistles, and mocks. Full of insatiable curiosity, part clown and largely a gossip and a meddler, it hides in the tangled undergrowth to tell the intruder just what it thinks of him.

Flycatching Warblers

The genera *Wilsonia* and *Setophaga* are rather small, lightly built warblers with bills slightly flattened and furnished with fine, projecting, bristles about the gape (Figure 301).

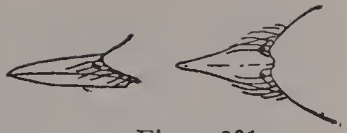


Figure 301
Bill of Flycatching Warblers.

685. **Black-capped Warbler.** (Including **Pileolated** and **Golden Pileolated Warblers**). WILSON'S WARBLER. WILSON'S BLACK-CAPPED WARBLER. *Wilsonia pusilla.* L, 5. Plate LXXIV A. A small green Warbler. Male is all bright yellow below with a sharply defined black cap on crown (Figure 302). The sexes are similar, but some juvenile females are entirely without the cap, and in others it is present but less perfect than in adults.

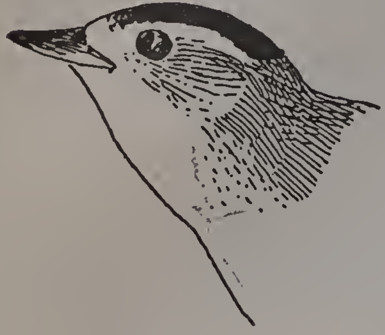


Figure 302
Wilson's Warbler; natural size.

Distinctions. The black cap and all-green and yellow coloration are distinctive of the adults and young males. When without the cap the vague yellow eyebrow stripe is characteristic. Birds without the black cap may resemble a small Yellow Warbler, but the inner webs of the tail feathers are never yellow.

Field Marks. The small size, all-bright yellow and green, with black cap or traces of it, or having yellow eyebrow-line when the cap is absent.

Nesting. On the ground, in nest made almost wholly of fine grass, lined with a few hairs; nest deeply cupped and quite substantial for a Warbler.

Distribution. North America. In Canada, across the Dominion, north to the tree limits.

SUBSPECIES. Three subspecies are recognized in Canada. Wilson's Warbler *Wilsonia pusilla pusilla* is the eastern form extending westward to Manitoba and probably northwestward into Mackenzie district. The Pileolated Warbler *Wilsonia pusilla pileolata* is slightly larger and a perceptibly brighter yellow (less green). It extends from Saskatchewan to the west coast. The Golden Pileolated Warbler *Wilsonia pusilla chryseola* is between the above two former in size and resembles *pileolata* in colour, but is still brighter yellow above. It is a bird of the extreme southwestern coast of British Columbia and southward. There is much mixing together of these birds in migration and *pusilla* may be found nearly to the west coast and birds with *chryseola* characters well inland.

A very pretty little golden Warbler usually found in willow or similar thickets near water.

686. **Canada Warbler.** CANADIAN FLYCATCHER. *Wilsonia canadensis.* L, 5·61. Male: even grey above slightly marked with black on crown; all below bright yellow except undertail-coverts which are white, yellow preloral line and eye-ring; black lores extending down sides of neck and forming a necklace of short stripes across upper-breast, leaving throat clear yellow (Figure 303). Female is similar, but necklace and black reduced, though usually remaining strong enough to retain the easily recognized specific character. Juveniles are like the female, but the necklace almost obliterated, showing only in vague, suffused, and interrupted cloudings.

Distinctions. The even grey above without markings and yellow below with the black necklace marks either sharp, dim, or suggested.

Field Marks. See distinctions.

Nesting. In mossy banks or under roots in nest of strips of bark and bits of dead wood wrapped in leaves and lined with fine rootlets.

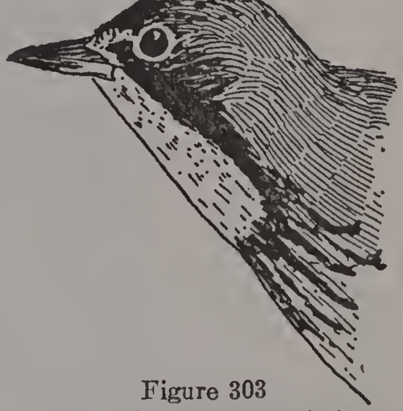


Figure 303
Canada Warbler; natural size.

Distribution. Eastern North America. In Canada, west to Manitoba and northwest to lake Athabaska. Occasionally in southern Saskatchewan and Alberta.

687. **American Redstart.** *Setophaga ruticilla.* L, 5·41. Plate LXXIV B. Adult male: shining black with white abdomen and undertail-coverts, orange spots at sides of breast, on wings, and sides of tail. Female and juveniles with black replaced by dull olive, changing to greyish on head and brown on wings and tail. Throat dusky white, changing to white below. Spots at sides of breast and on wings and tail similar to those of the male but reduced to dull yellow.

Distinctions. A perfectly characteristic bird in all plumages. No other Warbler has anything like this combination of orange-red and black, the former replaced in female by similar yellow or white patches on tail and wings. Juveniles have a slight yellow suffusion over breast and are without the wing blotch, but that of the tail is always present. Some young males in the spring look like females, but with irregular patches of the perfect male plumage showing on throat.

Field Marks. Colour is the most easily noted distinction, but even in black silhouette, the manner in which the long tail is thrashed about soon becomes familiar and distinctive.

Nesting. In the crotch of a sapling in nest of fine strips of bark, fibres, and plant down lined with tendrils and fine rootlets and nearly always covered outside with silvery bark strips.

Distribution. North America and northern South America. In Canada north to the Mackenzie and northern British Columbia.

The brilliancy of a high-plumage Redstart against the dark green of the trees is a constant source of pleasure to even the most blasé observer and is a sight that never loses its charm. Its sprightly movements, constant fluttering, and spreading of wings and tail give it a vivacity that few other species exhibit. Like many other American birds it was named by early settlers who regarded it as a familiar Old World form, though the resemblance is far from close.

FAMILY—MOTACILLIDAE. MEADOW WAGTAILS AND PIPITS

A family of chiefly Old World distribution that may be defined for recognition in Canada as gregarious ground birds with warbler-like bills and long hind claw (Figure 304). They are most like the Horned Lark in general outline and habit, but are slenderer and lighter in build and of a more earthy colour. There are but two species to consider in Canada.

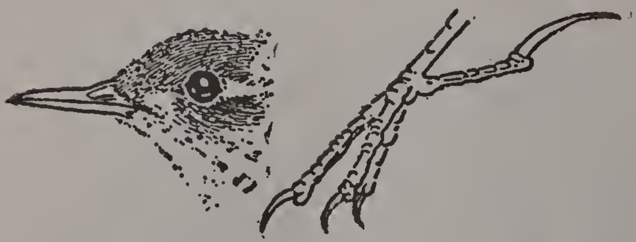


Figure 304

Bill and foot of American Pipit
long hind claw.

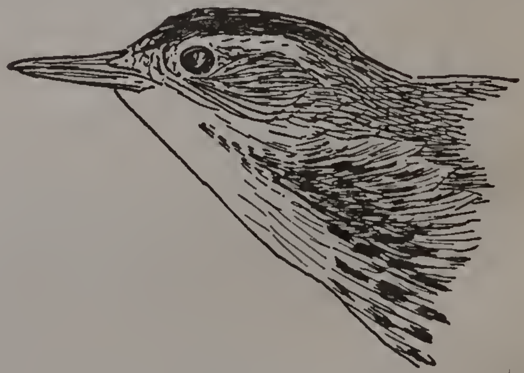
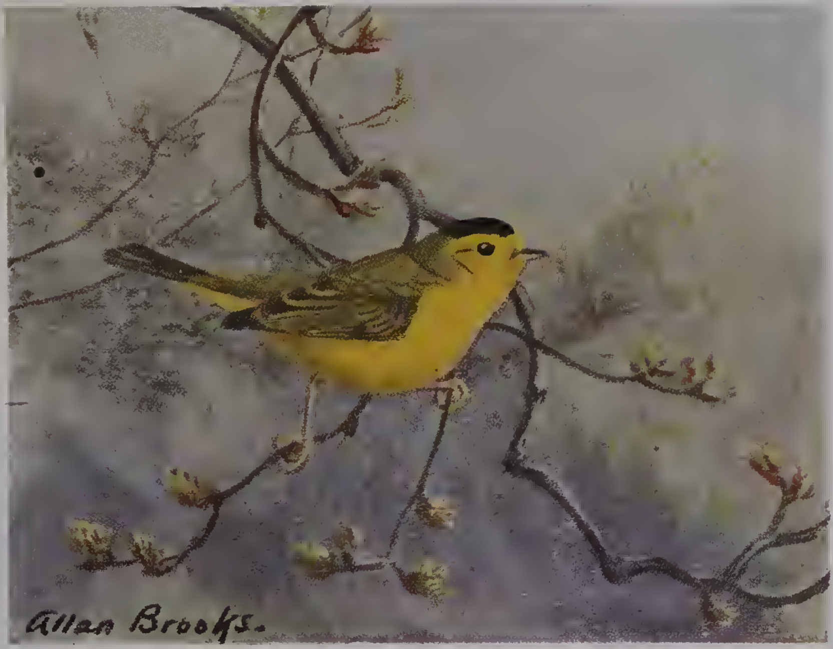


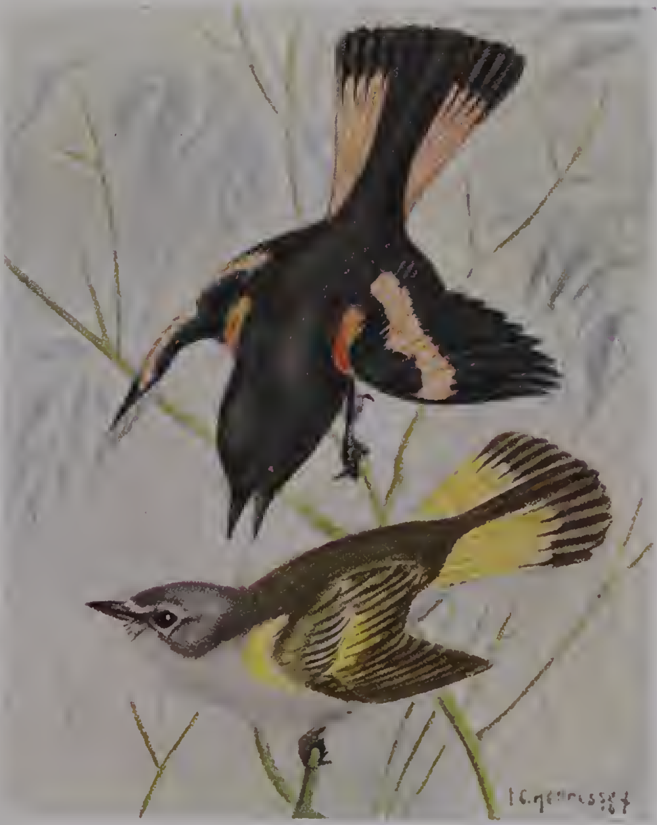
Figure 305

American Pipit; natural size.

697. **American Pipit.** TITLARK. *Anthus rubescens.* L, 6·38. A ground-coloured and ground-haunting bird; bill very warbler-like but longer, hind claw elongated like that of the Longspur and the Horned Lark (Figure 305, compare with Figure 250, page 253). Adult (in highest spring plumage): greyish above, purest on head and growing slightly olive on rump; back faintly mottled with dark feather centres; pinkish buff below, with sparse fine breast stripes of brownish grey, tending to form a necklace across breast and extending along flanks; wings brown with faded feather edges. This is rather an exceptional plumage, the one most often seen even in spring is evenly dull olive slightly mottled above; buffy white below with diffuse and more or less aggregated spots descending sides of throat and extending across breast and along flanks.


Allan Brooks.

A. Wilson's Warbler; scale, $\frac{1}{3}$
(Pileolated Warbler)



B. American Redstart; scale, $\frac{1}{2}$
Male
Female

Distinctions. The fine warbler-like bill, together with the long hind claw, are distinctive. The only other birds with such a claw are the Horned Larks and the Lapland Longspur, but the horns of the one and the sparrow-like bill (Figure 250, page 253) of the other make differentiation as a Pipit simple. Separated from Sprague's Pipit by its practically uniform grey or dull olive back, and by its ruddy, or dull-buffy, instead of creamy, colour below.

Field Marks. A ground-coloured bird, seen in the open in settled parts of Canada in the spring and autumn, often in large scattered flocks like the Snow Bunting and Horned Lark Its even coloration, constant habit of tail dipping, and the conspicuous white outer tail feathers are good field marks from all species except Sprague's Pipit. Its gregariousness and its habitat of bare ground, sand dunes, or mud flats are good guides to identity.

Nesting. On the ground in nest of grasses.

Distribution. Northern North America, west Greenland, and eastern Siberia, breeding from the Arctics south to the limit of trees.

A spring and late autumn migrant, occurring sometimes in large flocks and feeding in open meadows, ploughed fields, or on dry sandy uplands and shores. On its breeding grounds, it has the skylark-like habit of mounting and singing high in the air and descending in a perpendicular dive, like a falling stone.

Economic Status. Coming as it does when the fields are bare, and returning after the harvest, its food is necessarily confined to weed seeds and early or belated insects. Its effect must be beneficial.

700. **Sprague's Pipit.** AMERICAN SKYLARK. MISSOURI SKYLARK. *Anthus spraguei.* L, 6·50. A generally dry-earth coloured Pipit, streaked and variegated above with brown and creamy ochres; below even, creamy ochre, slightly warmer on breast where it is somewhat sharply streaked with brown.

Distinctions. Dull, soft coloration in simple design; warbler-like bill and long hind toe as a Pipit. Streaked or variegated above as Sprague's.

Field Marks. In life, not likely to be confused with its closest relative the American Pipit as it is a grass-haunter seldom seen when on the ground, and does not gather in flocks. As it rises from the grass it is more like a female Longspur or, because of its simple white outer tail feathers, a Vesper Sparrow. However, it has an entirely different habit of flight and instead of alighting shortly it is more likely to climb into the upper air and vanish overhead. Its flight song is unmistakable. Flitting around in wide circles, so high in the air as to be an all but invisible speck, it repeats over and over again in a thin sweet voice its simple little song. A *"Ching,-ring,-ring,-ring,-ring,-ring,-ring,-ring"* on a steadily descending scale, dropping about an octave in all, and lasting about five seconds. This may be repeated a hundred times or more with only a few seconds' interval, between. Sometimes it keeps steadily at it for twenty minutes, then it comes to earth in a straight dive like a falling stone and vanishes from sight in the short grassy covering of the prairie. It has much the sound of a very distant Wilson's Thrush song, but is longer, less rich, and silver rather than golden in tone. Some say this flight song is the equal of, or even superior to, that of the famous Syklark of Europe. Needless to say these are not Europeans but North Americans who have earnestly tried to be impartial. Born Englishmen are just as emphatic the other way, which all goes to illustrate how much early associations and traditions mingle with our enjoyments, and that the native born hears in familiar bird songs that which the expatriate can rarely appreciate in full. To those born to them the bag-pipes make satisfying and inspiring music, and in those who were raised to them, the soft warble of the Bluebird, the monotonous recitative of the Robin, and even the thin wiry song of Sprague's Pipit coming down from the clouds on the sere, broad prairies, touch a chord that may not be stirred by the most glorious foreign songsters of the avian chorus.

FAMILY—CINCLIDAE. DIPPERS OR WATER-OUZELS

A small but remarkable group in which warbler and thrush-like characters are blended and modified by singular aquatic habits. As only one species is here under consideration the specific description will be sufficient for recognition.

701. **Dipper.** AMERICAN WATER-OUZEL. *Cinclus mexicanus.* L, 6·50. Plate LXXV A. A little smaller than the Robin, but with short, stubby tail, solid dull, dark grey all over, faintly browning on head in adult and slightly lightening below in juvenility. No pattern or defined detail anywhere.

Distinctions. Solid grey all over without other defined marking and short stubby tail not extending back to tips of outstretched toes. Can be mistaken for no other Canadian species.

Field Marks. About the size of a large Sparrow or small Robin; slaty coloration; water-frequenting habits about mountain streams; diving, flying, and walking under water; dipping or bobbing habit when on land.

Nesting. In the rocks, near water or behind waterfalls. Nest of moss lined with fine grasses, arched over, with entrance in the side.

Distribution. Mountains of western North America. In Canada; British Columbia and adjacent Alberta foothills, north to Yukon river.

A very characteristic bird of the mountain streams. It dives or walks into the swiftly running water, disappears and reappears like a witch. Its nest is usually behind a waterfall and it dashes to or from it, through the falling veil, as indifferently as though a cataract were nothing. It is a winter as well as a summer resident and is as much at home on the slippery snowy margins and ice-draped rocks as on soft summer moss.

Economic Status. Unfortunately the Dipper has had laid against it well-substantiated charges of devouring large numbers of salmon eggs and small fry. As normally scattered, a pair here and another there throughout the summer, the damage done is probably slight, but when numbers congregate about restricted open waters in the winter time, especially in the neighbourhood of fish hatcheries, they are factors to be considered. Doubtless local conditions must govern our attitude towards it. In the lonely mountain streams it is a rare attraction to the landscape, and should receive every protection; where it is economically objectionable it may be well to reduce the superabundance. A few Dippers in their proper place add an air of wildness to the locality, but many in the wrong place may have an unpleasant effect.

FAMILY—MIMIDAE. MOCKERS AND THRASHERS

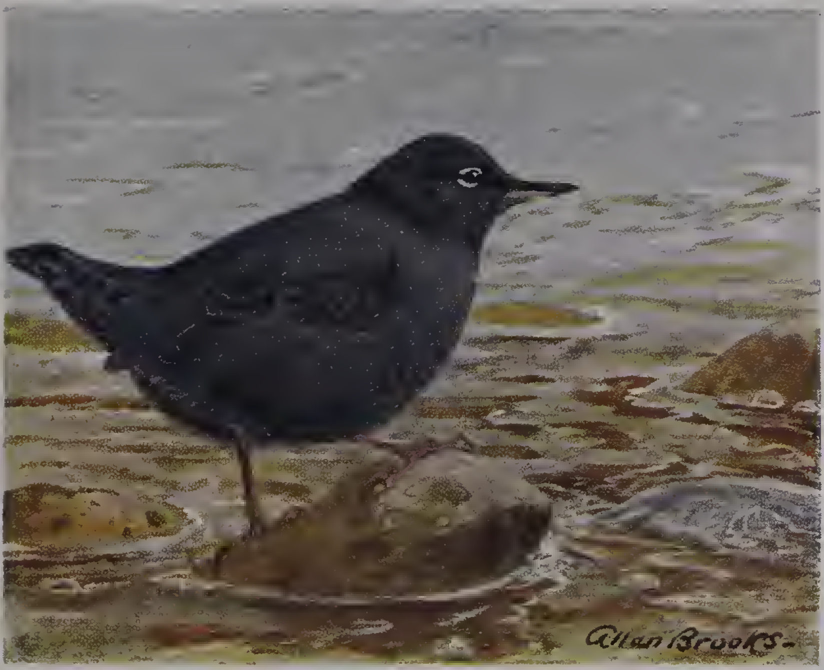
The imitative faculty of the Mockingbird that has given the family its name is well developed in Canadian representatives. The family is peculiarly American and like many of the subdivisions of the order *Passeres* is difficult to diagnose in non-technical language. The birds are rather large. The Catbird is of even shades of stone-grey and the Thrasher bright rufous brown above with heavily spotted whitish or creamy underparts and an unusually long full tail. They are both good mockers and diversify their song with imitations of all the common sounds around them, including the songs of other birds, and are capable of effects that are rarely equalled by the most famous songsters of either the New or Old World.

702. **Sage Thrasher.** *Oreoscoptes montanus.* L, 8·00. Like a small, pale-coloured Brown Thrasher (*See* Plate LXXVI A); back brownish-ash instead of clear rufous-brown; in juvenility obscurely striped and feather-edged. Below, dull, creamy white, heavily and sharply spotted on throat, breast, and flanks with brown.

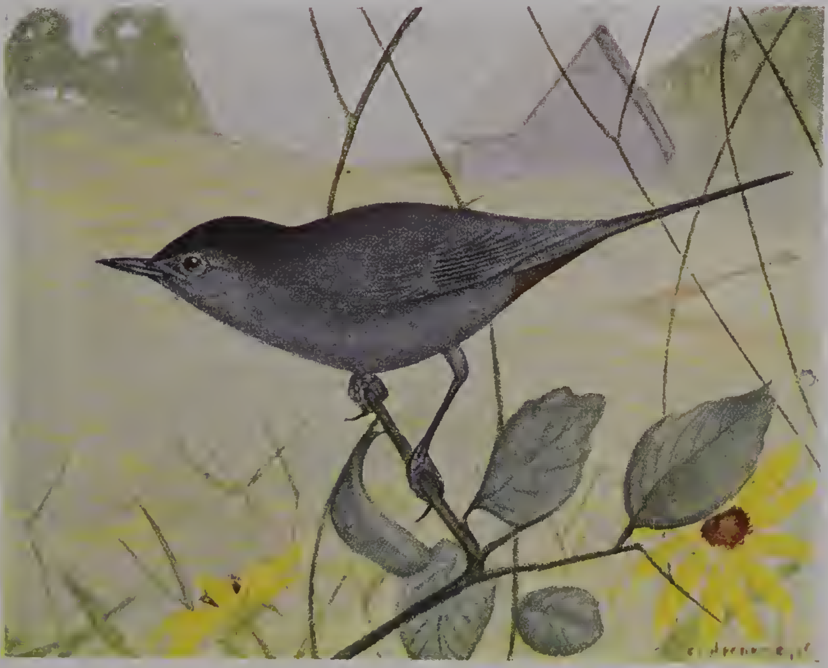
Distinctions. Like a Brown Thrasher but much smaller, and in general dry-earth tones, instead of clear rufous-brown, and with white tips to the outer tail feathers. The back usually shows a slight suggestion of streaking, that of the Brown Thrasher never does.

Nesting. In sage brush, nest of thorny sticks, slightly domed and lined with fine bark strips.

Distribution. Western United States, in arid sage-brush plains. In Canada known only from the southern Similkameen and Okanagan valleys.



A. Dipper; scale, $\frac{1}{3}$



B. Catbird; scale, $\frac{1}{3}$

A bird of the hottest and driest sage-brush plains. Very shy and retiring and not to be seen except by the most enthusiastic and persistent student of birds.

704. **Catbird.** *Dumetella carolinensis.* L, 8·94. Plate LXXV B. Evenly slate-grey all over except for a black cap and chestnut undertail-coverts.

Distinctions. Not likely to be mistaken for any other species. In spite of uniform greyness like the Dipper an entirely different looking and acting bird—long and slender, with long tail and black cap. A brush-haunter with no particularly aquatic habits.

Field Marks. Even grey colour with black cap and sprightly habits. Its characteristic call, a cat-like "*Meouw*", has given the bird its name. Another common note is like "*Ma-ry*" many times repeated and has suggested the homely name of Mary-bird. Its song is very fluent and easily distinguished from the similar one of the Brown Thrasher by its consisting of single phrases.

Nesting. In thickets or densely foliaged shrubs, nest of twigs, grasses, and leaves lined with rootlets.

Distribution. Eastern North America. In Canada, across the southern part of the Dominion west to the coast in southern British Columbia.

Though the acknowledged vocal inferior of the Mockingbird, the Catbird at its best rises to a high position as a songster, but there is much individual variation and while one bird may be of prima-donna rank, an excellent singer, the next may be quite ordinary in voice and performance. Much depends on the sounds it hears, as it is a mocker by disposition and inclination, and it takes the agonizing squeak of an ungreased wagon wheel or a rusty barn-door hinge as a model as readily as more agreeable sounds. But even with such parenthetic interpolations occasionally introduced the song of the Catbird is a remarkably fine performance when listened to with an understanding ear. Those to whom it has become endeared by association might not trade it for a more consistently perfect performance. A good Catbird song needs no excuse or apology. Its common plaintive inquiry for "*Ma-ry*" may become slightly exasperating when reiterated too close to the house. Its usual call note like the mew of a cat, which it utters in the brush while curiously investigating the human intruder, is well-known to most country frequenters, and seems to have aroused some slight prejudice against it in the minds of its less experienced hearers.

It is a brush frequenter, and like many other species haunting such habitats from whence close observations can be made with a minimum of danger, its curiosity is well developed. It sits on some tall spray rising above the general tangle, its tail depressed and body held low to the perch, and pours forth its medley of song. Phrase follows phrase in rapid succession and snatches of all the bird songs of the neighbourhood appear intermixed with occasional harsher notes which are given with as much care and finish as the more melodious ones. When an intruder is detected approaching, the outpour stops with a sudden squeak, the tail flies up, and the bird comes to attention. After a moment's observation it drops to a lower level where, with safe tangle close at hand, it saucily investigates the approaching intruder, and, with expressive tail, wig-wags the results of its observations, presumably to a hiding mate. Finally it plunges into the tangle where, confident of security, it peers out at the disturber of its privacy through the many small openings between crisscrossed branches. Gradually it works closer and closer for a better view, hopping from perch to perch, alert, mewing and uttering low asides to the world in general and perhaps its mate in particular. Its remarks may be humorous and even sarcastic but never become caustic, and though the general bearing is saucy it never degenerates into impudence. When left to its own devices and at ease, the Catbird often hunches up and fluffs its feathers in a shady retreat within hearing distance of its incubating mate and carries on a long low-toned monologue, every tone soft and throaty and altogether delicious. What it says then is impossible to translate and probably is none of our business.

Economic Status. The Catbird lives largely upon fruit in season, of which perhaps a third may be regarded as cultivated, but many insects are also taken. The fruits are small, soft varieties and it is very seldom, if ever, that perceptible damage is done.

705. **Brown Thrasher.** *Toxostoma rufum.* L, 11·42. Plate LXXVI A. A large, reddish-brown bird with long, sweeping tail. Uniform reddish above, creamy white below, sharply striped with dark brown on breast and along flanks.

Distinctions. The Brown Thrasher with its red-brown back and sharply streaked breast has the general outward appearance of a Thrush, but its large size, ruddiness of the brown, straw-coloured eyes, and long tail are distinctive.

Field Marks. The bright red-brown back, sharply striped breast, long tail, and general carriage and habits.

Nesting. In thickets or on the ground, in nests of twigs, coarse rootlets, and leaves, lined with finer rootlets.

Distribution. Eastern United States. In Canada, across the southern parts of the Dominion west to Alberta.

The Brown Thrasher is probably the best common Canadian songster from Ontario westward.

Its song, very similar to that of the Song Thrush of Europe, is a succession of phrases like that of the Catbird, but without its occasional discordance and more liquid and mellow in tone. The notes are uttered close together and continue for several minutes, sometimes in great variety. Thoreau has translated some of them as *"Drop it—drop it—cover it up, cover it up—pull it up, pull it up."* The repetition of each variation is one of the peculiarities of the song of the Brown Thrasher, by which it may be distinguished from the Catbird.

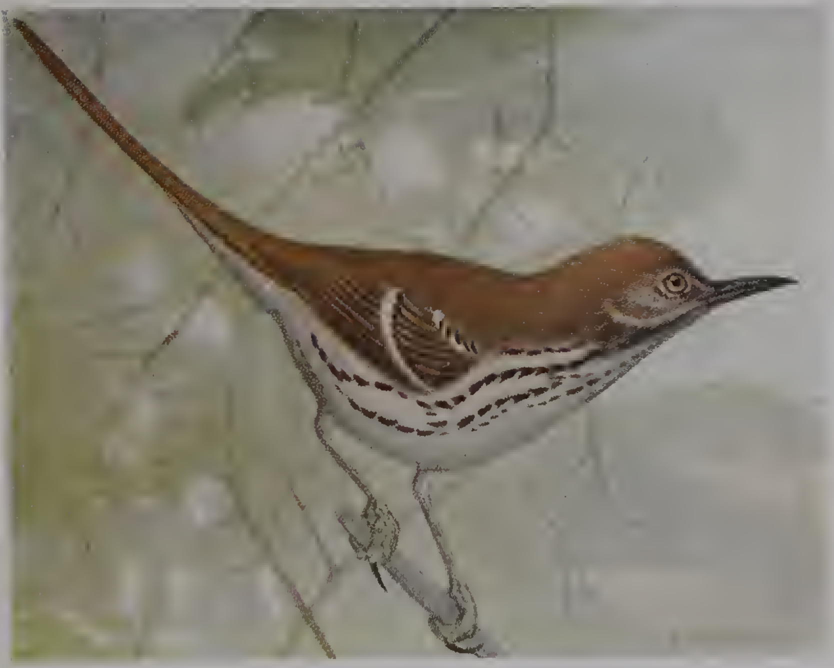
This is also a bird of the thickets inhabiting open tangles, clumps of bushes in meadows, and the edges of woods and fence-rows. The Thrasher is rather more retiring than the Catbird and is less easily induced to come into the home grounds.

Economic Status. A decidedly useful bird, over one-half of its food being injurious insects, beetles, caterpillars, grasshoppers, etc. The remainder is largely fruit, a small part of which is, probably, cultivated and is mostly raspberries. On the whole it does little damage and much good.

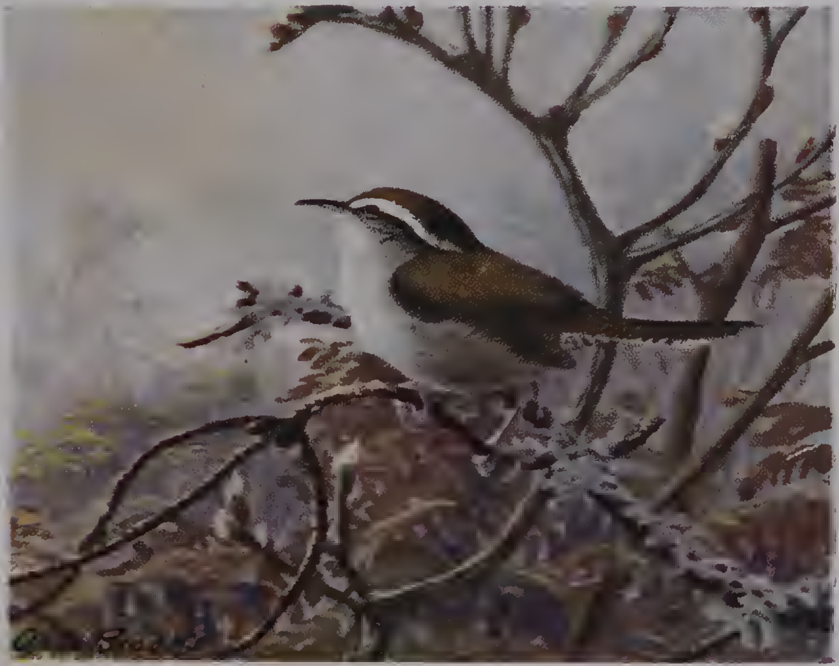
FAMILY—TROGLODYTIDAE. WRENS

The Wrens are small brown birds living close to the ground. Though diminutive in size they are very energetic and except when brooding or asleep are rarely still. They may be recognized by their small size, brown coloration, small stubby tail often thrown up over the back, and their restless habits, winding in and out amongst the densest brush piles more like mice than birds. The Wrens are a large family well distributed over the world, but better represented in species in the New than in the Old World. Their habitat varies from watery swamps to arid canyons and from open thickets to deep dense woods. The family name *Troglodytidae*, cave-dwellers, is derived from their habit of nesting in holes.

PLATE LXXVI



A. Brown Thrasher; scale, $\frac{1}{3}$



B. Bewick's Wren; scale, $\frac{1}{3}$
(Seattle Wren)

715. **Rock Wren.** *Salpinctes obsoletus.* L, 5·75. A large Wren. Above, evenly greyish-brown, greyer on head and approaching cinnamon on lower back and rump; dull whitish below; faintly streaked with brownish on breast.

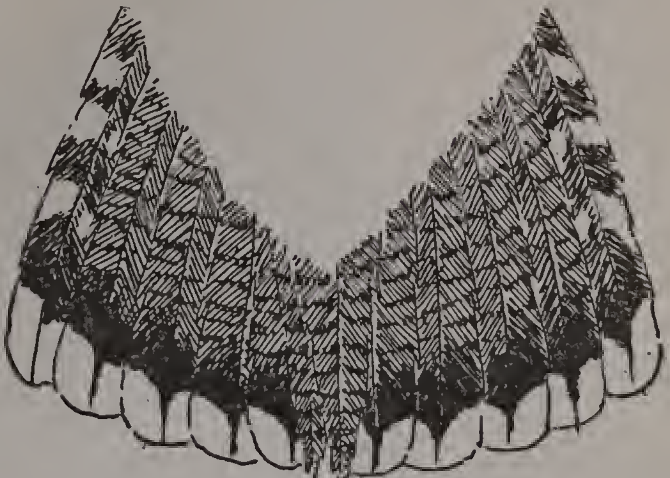


Figure 306
Tail of Rock Wren; natural size.

Distinctions. Easily separated from any other Wren by its general even, pale greyish or dry-earthy coloration variegated above by barely perceptible black and white arrow-head spots and suggestions of vermiculation. The tail broadly terminated with white or whitish, with sharply contrasting subterminal suffusion of brownish-black (Figure 306), is very characteristic.

Field Marks A large, dry-earth coloured Wren inhabiting the most arid canyon faces and badlands. Its song, far carrying and clear, quite unlike the bubbling confusion of the House or other familiar Wrens, attracts attention immediately. It approaches to, and retreats before, the puzzled observer in the most baffling manner. Once a few of the infinite variety of their notes are learned, many unfamiliar, clear, or pearly notes will be attributed to this species.

Nesting. In crannies in rocks and cliffs, nest of sticks, grasses, wool, hair, and other soft materials. A peculiarity is that each nest entrance is approached by a little path paved with pebbles.

Distribution. Western North America. In Canada, the bad lands and rocky defiles of southern Saskatchewan, Alberta, and British Columbia.

SUBSPECIES. The form accredited to Canada is the type race, *Salpinctes obsoletus obsoletus.*

The Rock Wren is the very spirit of the mysterious bad lands. Where canyon walls or coulée sides are broken, steep, and bare, where the mercury stands near the top of the tube, and not a drop of water can be found, the Rock Wren is at home. Stealing in and out of crevices, exploring cracks in the hot cliffs to their deepest extremity; the busy little midget never rests. Its voice can be heard here, there, and everywhere and when we attempt to steal closer it is gone to mock us from the next neighbouring buttress.

717. **Canyon Wren.** *Catherpes mexicanus.* L, 6. A rather large Wren with very long, slender bill (Figure 307). Above, bright reddish-brown changing to cinnamon on tail and greying on crown, finely speckled with minute black and white spots except on tail which is sharply barred with dark brown. Brown extending below over abdomen, brown speckled or finely vermiculated with black; throat and breast white.

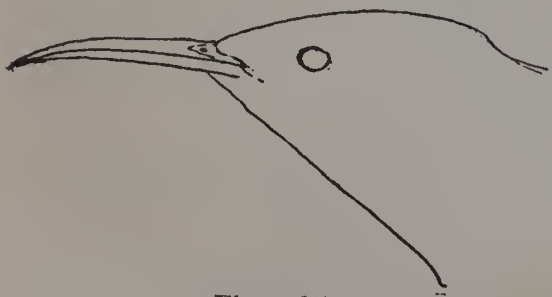


Figure 307
Bill of Canyon Wren; natural size.

Distinctions. The long, slender bill, warm speckled ruddy brown back, and white throat are diagnostic characters.

Field Marks. By habitat likely to be confused only with the Rock Wren, but of warm ruddy brown colour with conspicuous white throat instead of general dull dry-earthy hue. Its song, consisting chiefly of a regularly descending scale of clear individual whistled notes, is very distinctive.

Nesting. Like the Rock Wren in crevices of rocks and cliffs.

Distribution. Arid parts of United States and Mexico. In Canada known only in the southern Okanagan valley of British Columbia.

SUBSPECIES. The form to be expected in Canada is the Spotted Canyon Wren, *Catherpes mexicanus punctulatus.*

The Canyon Wren is an unsurpassed rock-creeper. So high up the rocky canyon walls as hardly to be recognizable as a bird it creeps and runs across the rocky surfaces, indifferent as to whether they are horizontal, perpendicular, or overhanging. Occasionally it disappears into some cranny and remains in secret seclusion. At intervals it emerges and perching on the tip of some outstanding spur, only its white throat showing over the edge, it drops its clear staccato notes in rapid but unhurried succession. They bound and rebound from the rocky masses, echoing and re-echoing, and momentarily fill the valley with their liquid tones.

719. **Bewick's Wren** (Including **Seattle Wren**). *Thryomanes bewicki.* L, 5·60. Plate LXXVI B. A little larger than a House Wren. Even, warm chocolate brown above, throat and breast white, clearest on throat; shaded with greyish and brownish on flanks.

Distinctions. With size, brown coloration, and habit likely to be confused only with the House Wren. The back is warm dark brown instead of ashy-brown and is without barring or vermiculation except on tail and wing quills. The white is clear on throat instead of being tinged with brownish. No barring on flanks.

Field Marks. A medium-sized dark-brown Wren without barring or vermiculation on body. A very distinct white eyebrow streak. Haunts the vicinity of buildings and tangled thickets much like the House Wren.

Nesting. In holes or crannies in stumps, buildings, or bird-boxes. Like the House Wren it sometimes occupies the most absurd nesting quarters. Nest of dried grasses and leaves, rarely of twigs; lined with wool, hair, or feathers.

Distribution. United States and Mexico. In Canada, occasional in extreme southern Ontario, and common in southern British Columbia west of the Coast range.

SUBSPECIES. The form attributed to British Columbia is the Seattle Wren *Thryomanes bewicki calophonus.*

One of the notable songsters of our southwestern coast. It has the intimate, confiding attitude of the House Wren when in contact with civilization, but has a finer, more liquid voice. Altogether a very delightful bird to have around and as far as present reports go it does not seem to develop the occasional reprehensible intolerance towards other species nesting in the vicinity.

721. **House Wren** (Including **Western House Wren**). *Troglodytes aedon.* L, 5. Plate LXXVII A. A slightly ashy-brown Wren, finely but softly vermiculated with dark brown on back and barred across tail and wings. Below creamy white, slightly browning across the breast and flanks and softly barred on the latter.

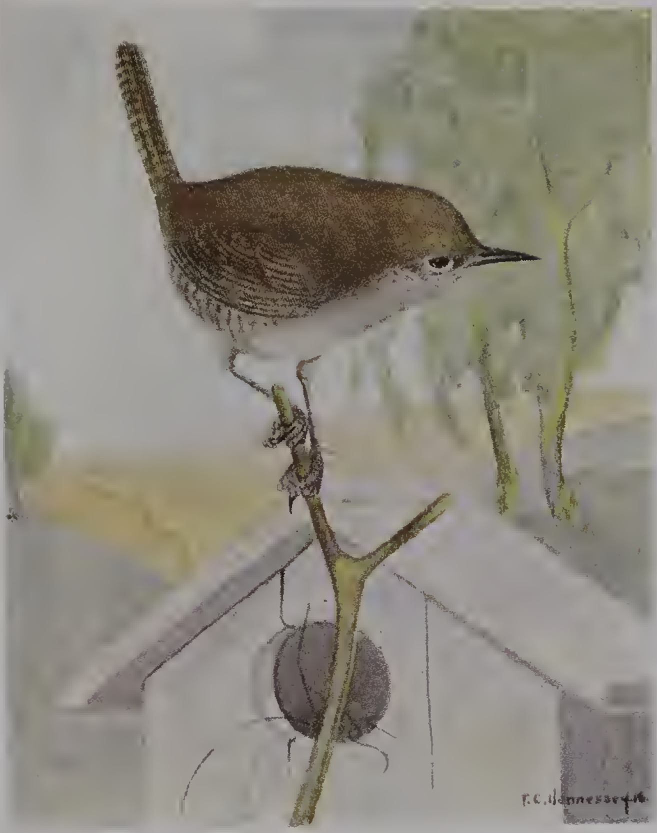
Distinctions. An ashy-brown Wren creamy below, but without any strongly characterized markings. By habitat most likely to be confused with Bewick's Wren of the southern British Columbia coast. It is a greyer brown with fine vermiculations on back and the whiteness of the underparts is strongest on the abdomen instead of the throat. No eyebrow stripe as in Bewick's or the Long-billed Marsh Wrens. No back striping as in the Short-billed and not strongly coloured below as is the Winter Wren.

Field Marks. An ashy brown Wren slightly vermiculated on back and flanks and creamy white below, clearest on abdomen. No facial marks or striping anywhere.

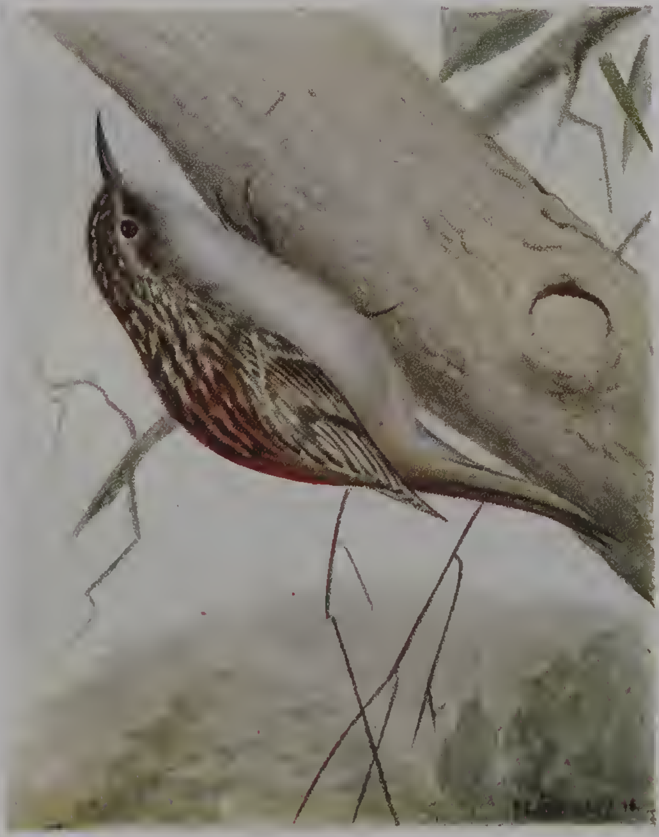
Nesting. In a hole in a tree, bird-box, or similar places, in a nest of twigs, lined with grasses, feathers, etc. The House Wren will occupy any kind of bird-house that is suitably placed. The English Sparrow can be kept away by making the entrance hole small; a one-inch auger hole is sufficient for a Wren and will bar the Sparrows entirely.

Distribution. United States and southern Canada. In Canada, across the Dominion as far north as the heavy spruce forest region.

SUBSPECIES. The Eastern House Wren *Troglodytes aedon aedon* extends westward to or near the Manitoba line. The Western House Wren *Troglodytes aedon parkmani,* slightly paler and greyer, with the back a little more distinctly barred, occupies the country farther west. The distinctions are fine, however, and the division between the ranges is not well marked.



A. House Wren; scale, $\frac{1}{2}$



B. Brown Creeper; scale, $\frac{1}{2}$

The House Wren is a busybody; it has the business of everybody else to attend to, as well as an enormous amount of its own, and it raises infinite protest. Its energy is irrepressible; no crack or crevice in the fence escapes its fine, investigative bill, and scarcely a leaf stalk in the garden but is carefully examined above and below for such insects as it may yield. It bustles hither and thither scolding and ejaculating until unable to suppress its mere happiness, and in spite of the heavy responsibility of ruling the garden it flits to an elevated perch and fairly boils over with a rolling, spluttering song that seems to gush out of its little throat more quickly than it can articulate the notes. It is an indefatigable singer. During the height of its song season it can be depended on for a song a minute throughout the busy hours. As if this were not enough to work off its superabundant energy, the House Wren fills with sticks every possible cavity or nesting site it does not occupy. This not only satisfies its exaggerated nest-building instinct, but, the method in its madness, it effectually prevents other birds from building within its declared preserves. It is intolerant of bird neighbours of either its own or of other species and herein is shown a darker side to its character. Not able to oppose other species directly, it sometimes resorts to questionable practices to preserve the inviolability of its territory and steals into the nests of other birds in their absence and punctures their eggs. This may be largely the habit of some individuals rather than a general specific one, but it is common enough to deserve notice. House Wrens are delightful birds to have about the house, but if other species are desired or present, the busy little mischief-maker must be closely watched and in extreme cases eliminated.

722. **Winter Wren** **(Including the Western Winter Wren).** *Nannus hiemalis.* L, 4·05. A small Wren of very dark, even coloration. Below, rich wood-brown only partly lightening, and sometimes faintly greying below. Back faintly, and flanks and abdomen heavily, vermiculated or finely cross-barred.

Distinctions. General wood-brown, especially the rich full colour below and the heavy barring on flanks and abdomen.

Field Marks. A small, darkly coloured, brown Wren; commonly found in deep woods.

Nesting. Under logs or roots in deep woods. Nest of moss, lined with wool and fine materials.

Distribution. North America. In Canada, across the Dominion except the prairie sections, north to lake Athabaska and northern British Columbia.

SUBSPECIES. Two subspecies have been recognized in Canada. The Eastern Winter Wren *Nannus hiemalis hiemalis* occurs west to the mountains. The Western Winter Wren *Nannus hiemalis pacificus* is the bird of British Columbia. It is darker, richer, and warmer brown, and with little or no greying on breast. Several other subspecies are found in Alaska, but as yet have not been detected in Canada even in migration.

A bird whose vocal powers have hardly been appreciated at their true worth. It is perhaps the finest songster of the northern woods. Its song, strangely disconnected yet continuous, composed of jerkily jumbled trills and staccato notes, dies down as though about to cease, only to revive and continue with full vigour several seconds longer. The length of a complete typical song is between eight and ten seconds and is thus one of the longest performances of any of our birds. It is shy and retiring, and inhabiting the densest and deepest woods is seldom heard in full song by the ordinary observer and still more rarely seen by him.

724. **Short-billed Marsh Wren.** *Cistothorus stellaris.* L, 4. A very small Wren; light below and decidedly streaked in wood-browns above and on crown.

Distinctions. A small Wren, sharply streaked above to crown (Figure 308).

Field Marks. A small Wren with streaked back and crown, inhabiting dry marsh and grass.

Nesting. In dry marshes, amidst the grass. Nest a globular structure of green grasses, placed low down near the ground. Many false nests are built in the grass tops in the vicinity of the one occupied.

Distribution. Eastern North America. In Canada, the southern parts of the Dominion west to central Saskatchewan.

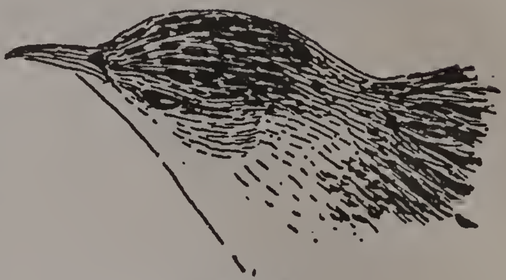


Figure 308
Short-billed Marsh Wren; natural size.

The Short-billed Marsh Wren is local and irregular in its distribution; it may be present one year in a locality and absent the next, and little is really known of its distribution in Canada. It frequents damp, grassy marshes rather than wet swamps and is usually found in little colonies. It is shy and difficult to find in its regular haunts, and its voice is entirely different from that of the Long-billed Marsh Wren with which it may occasionally be confused.

725. **Long-billed Marsh Wren** (Including **Prairie** and **Western Marsh Wrens** and **Tule Wren**). *Telmatodytes palustris.* L, 5·2. A richly coloured Wren with dark brown, or almost black, mantle falling from hindneck over shoulders which are streaked with white; all remainder above brownish-red; creamy-white below, with flanks washed with light brown.

Distinctions. A Wren with a streaked back and a uniformly coloured crown.

Field Marks. A Wren inhabiting wet cat-tail or tule marsh, streaked on back, plain on crown, and with a decided eyebrow-line (Figure 309).

Nesting. Near the top of the reeds or rushes in wide, wet marshes; nest, a ball of dead cat-tail leaves, grass, or reeds. Unlike many other marsh-haunters this species is not attracted by marshes of small size. A swampy pool a few yards across attracts the Red-wing and perhaps a Rail or two, but the Long-billed Marsh Wren demands a considerable area. An interesting trait of the Marsh Wren is the habit of building numerous sham nests near the one really occupied. The use made of these nests is not known, but as many as eight or nine nests that can be reasonably attributed to the efforts of one pair may at times be found.

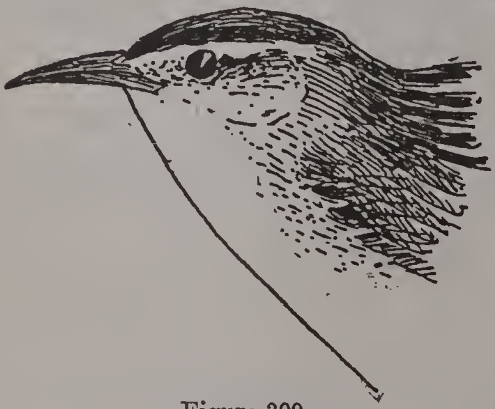


Figure 309
Long-billed Marsh Wren; natural size.

Distribution. United States and southern Canada. Across the Dominion.

SUBSPECIES. Four subspecies of this species are recognizable in Canada. The Eastern Marsh Wren *Telmatodytes palustris palustris* extends west to the Great Lakes. The bird of Manitoba and west to the mountains is the Prairie Marsh Wren *Telmatodytes palustris iliacus*, a lighter coloured bird, especially on the back, where the dark cape is less continuous and the light browns tend toward ochre. The Western Marsh Wren *Telmatodytes palustris plesius* inhabits the interior of British Columbia; it is like the prairie bird, but the breast is dirty greyish instead of white or washed with clear tawny. On the coast we have the Tule Wren *Telmatodytes palustris paludicola*, a generally much darker bird than any of the above.

Wide watery tule swamps or quaking bogs grown with cat-tails and reeds are the places to expect the Long-billed Marsh Wren. Here in the reedy tangle just above the water it climbs and creeps about, scolding occasionally but usually keeping well from sight. At a safe distance from the intruder it mounts a tall, solitary stalk to reconnoitre and then launches itself into the air some 10 or 15 feet and gurgles out a rippling melodious little song as it gently sinks on fluttering wings to another station. This bubbling song of the Marsh Wren is one of the pleasantest characteristics of the marsh lands.

FAMILY—CERTHIIDAE. CREEPERS

The name of the only Canadian Creeper, the Brown Creeper, describes the bird very well. It is a small brown bird that creeps or climbs woodpecker-fashion on the trunks and larger branches of forest trees. It is smaller than any Canadian Woodpecker and the bill is comparatively long, light, delicately tapered, and sickle-shaped (Figure 311), adapted for extracting small insects and insects' eggs from narrow cavities but not for chiselling in even the softest wood or bark to reach them. The tail is rather long and stiff (Figure 310) and the claws are quite long and much curved.

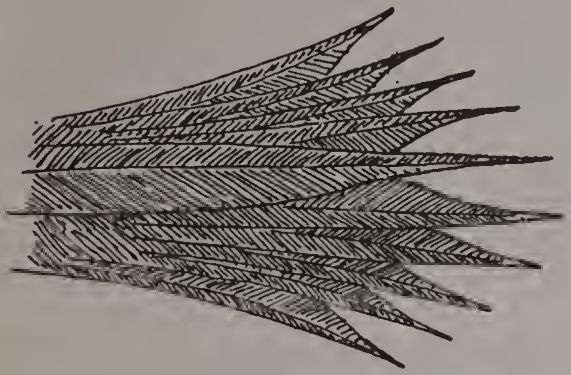


Figure 310
Tail of Brown Creeper; natural size.

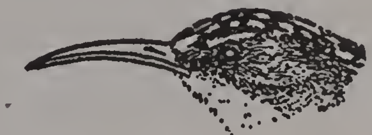


Figure 311
Brown Creeper; about natural size.

726. **Brown Creeper** (Including the **Rocky Mountain, California,** and **Sierra Creepers**). *Certhia familiaris.* L, 5·66. Plate LXXVII B. A small, wood-brown bird, white below; and evenly striped with white above. A long, curved, delicately pointed bill (Figure 311), and a long, stiff tail of pointed feathers (Figure 310).

Field Marks. Our only small brown bird with pronounced tree-creeping habits.

Nesting. Behind the loose bark of trees in nest of twigs, strips of bark, bits of dead wood, moss, etc.

Distribution. Greater part of northern hemisphere. In Canada, across the Dominion except on the treeless prairies.

SUBSPECIES. Four subspecies of Brown Creeper are accredited to Canada. The Eastern Brown Creeper *Certhia familiaris americana* extends as far west as Manitoba. It is not known whether it, or any Brown Creeper, extends north of the prairies or to the mountains. The Rocky Mountain Brown Creeper *Certhia familiaris montana* should occupy from central Alaska, through central British Columbia and to Alberta and along the mountains. It is a pale greyish bird. The California Creeper *Certhia familiaris occidentalis* is brown and tawny and should occur on the British Columbia coast. The Sierra Creeper *Certhia familiaris zelotes* is even browner and should range over the interior of southern British Columbia. The distinctions of these races are rather fine for popular recognition.

Pressed tightly to the trunk of forest trees the Brown Creeper may be seen spiralling up the perpendicular trunk and industriously gleaning from every crack and crevice in the bark. Reaching the section where the branches begin to grow smaller and the bark smooth it drops down to the base of an adjoining tree and works upward again, never hurrying, never pausing, filling its stomach with small beetles, larvæ, and insect eggs. The skill with which this bird can cling to smooth surfaces is remarkable. The writer once saw a Brown Creeper climb the polished corner of a black walnut bookcase with as little concern as if it had been the roughest-barked oak in the woods.

Economic Status. The Brown Creeper is purely insect-eating in its habits and its constant microscopic attention to every little crevice in the rough bark must account for innumerable insect pests. Most of its work is done in the woods, but as the bird frequently appears in the orchard and on shade and ornamental trees about the town and house the species has a powerfully beneficial influence.

FAMILY—SITTIDAE. NUTHATCHES

The Nuthatches are small, woodpecker-like birds in general habit, but their toes are of the usual Passerine type with three toes in front and one behind instead of the characteristic two and two of the Woodpeckers. The bills are somewhat like those of the Woodpecker in outline, but without their chisel-shaped point and are set on a slightly up-tilted angle with the head, giving a turned-up or retroussé appearance (Figure 312, compare with Figure 241, page 226). The colours of our species are characteristic. The name Nuthatch is derived from their habit of wedging nuts and other hard food into crevices and "hatching" or hacking them until an entrance is made. Though capable of considerable excavating in wood or bark they do not use their powers to delve deeply into trees, but as a rule content themselves with flaking off the loose bark scales and searching the open cavities and seams.

727. **Carolina Nuthatch** (**Including Slender-Billed Nuthatch**). WHITE-BREASTED NUTHATCH. BIG QUANK. *Sitta carolinensis.* L, 6·07. Plate LXXVIII A. Above, slate-blue with shiny black crown, hindneck, and upper shoulders. Female: duller. Below, white, including all of face, with chestnut about vent and on undertail-coverts. Juveniles: with flanks and lower abdomen also slightly washed with chestnut.

Distinctions. With creeping habits and general coloration, to be mistaken only for the Red-breasted Nuthatch, but larger, and the breast and most of the underparts pure white instead of heavily washed with rufous. The sides of the face are pure white (Figure 312), instead of with a black line through eye and a prominent white eyebrow-line (Figure 313). The Pygmy Nuthatch is much smaller, and has a brownish crown blending into a dark eye stripe (*See* Figure 314).

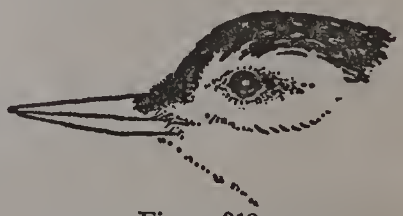


Figure 312
White-breasted Nuthatch; about natural size.

Field Marks. Creeping habits, and even, blue-grey back are characteristic of the Nuthatches. The white underparts and the solid white face separate the White-breasted from the other species.

Nesting. In a hole in a tree, usually a natural cavity, in nest of leaves, feathers, etc.

Distribution. Temperate North America. In Canada, across the southern part of the Dominion, rare or absent on the prairies.

SUBSPECIES. Two subspecies are recognized in Canada. The White-breasted Nuthatch *Sitta carolinensis carolinensis* extends west including Manitoba and probably through the northern forested areas to the mountains. The Slender-billed Nuthatch *Sitta carolinensis aculeata* occupied southern British Columbia. The grey on the back is slightly darker, or duller in tone and the bill averages slightly longer in proportion to its width. The Rocky Mountain Nuthatch *Sitta carolinensis nelsoni* has been attributed to Canada in error.

The climbing and trunk-creeping of the Nuthatches is a wonderful accomplishment. They travel upwards or downwards, forwards or backwards, or even along the underside of branches like flies on the ceiling, with apparently equal ease. Though industrious little workers they enjoy life in their own quiet way, being neither so absorbed in their never-ending task of keeping the tree trunks free from insects as their friend and oft-time companion, the Brown Creeper, nor so light-hearted and mercurial as the irrepressible Chickadees. They take time occasionally to court, play, chase each other merrily about, and to sing a little spring song, to show that they are not overcome by their responsibilities. Their usual note is a hoarse "*Quank-quank*" and they are often found with small groups of Chickadees and Creepers; they do their share in holding the little company together with their frequent conversational remarks.

Economic Status. One of the most useful birds. Although it pays much attention to forest trees it often comes to orchard and shade trees and as a member of the above-mentioned company, which examines with microscopic eyes every part of the winter tree trunks for insects, it consumes great quantities of pests in adult, egg, or larval stages.

728. **Red-breasted Nuthatch.** LITTLE QUANK. *Sitta canadensis.* L, 4·62. A smaller Nuthatch than the white-breasted Carolina. Above, slaty-blue with shiny black crown and hindneck, duller on females. Below, all rusty ochre. Cheeks white, a sharp black line through eye expanding on upper shoulders, and a conspicuous white eyebrow streak (Figure 313). Juveniles with the rusty ochre below reduced.

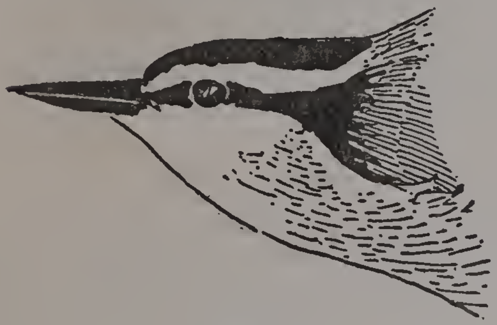


Figure 313
Red-breasted Nuthatch; natural size.

Distinctions. Small size, general ruddy colour beneath, the black bar through eye, and a conspicuous white eyebrow streak.

Field Marks. As above.

Nesting. In hole in tree or stump, nest of grasses or moss.

Distribution. North America. In Canada, across the Dominion north to Great Slave lake.

A slightly more active bird than the preceding, and more inclined to forage about the extreme tips of branches and to cling there upside down very much like Crossbills. This is the commoner Nuthatch in the prairie sections.

730. **Pygmy Nuthatch.** *Sitta pygmaea.* L, 4. The smallest of our Nuthatches. Above, slaty-blue changing to greyish brown or olive-grey on crown. Sometimes a dull white cloud on nape. Below, creamy white, clouded with light grey on flanks. Cheeks white, and a dark bar through eye, blending into crown without any eyebrow streak (Figure 314).

Distinctions. Small size, almost clear white below, and greyish brown or slightly olive crown continuous with dark eye-bar.

Field Marks. As above.

Nesting. In crevices in bark or holes in stubs, lined with wool, feathers, and other soft materials.

Distribution. Western United States and Mexico. In Canada, the southern interior valleys of British Columbia, confined to the region of Yellow Pine *Pinus ponderosa.*

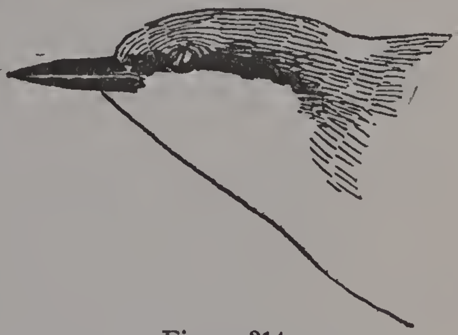


Figure 314
Pygmy Nuthatch; natural size.

A very characteristic bird of its habitat. As agile and lively as the Red-breasted Nuthatch and, going in flocks, when too high or distant to show details, they may be taken for Crossbills or Pine Siskins. The notes are only faint chippings, quite unlike the hoarse "quanking" that is so characteristic of the other Nuthatches.

FAMILY—PARIDAE. TITMICE

The Titmice are birds of wide distribution in the northern hemisphere and are as familiar to European residents as to us. They are small birds with rather short but comparatively strongly arched bills (Figure 315). Their plumage characters are usually easily recognized.

735. **Black-capped Chickadee** (Including **Long-tailed** and **Oregon Chickadees**). CHICKADEE. *Penthestes atricapillus.* L, 5·25. Plate LXXVIII B. A diminutive bird. Back, olive grey, with intensely black crown spreading over face to eyes and down back of neck; below white with sandy suffusion on flanks; a full black throat in sharp contrast to pure white cheeks.

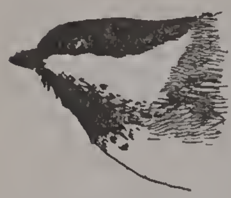


Figure 315

Black-capped Chickadee; scale, ½.

Distinctions. Easily recognized as a Titmouse or Chickadee. The intensely black crown and throat will separate from the Brown-headed; the lack of white eyebrow stripe from the Mountain; and the lack of rufous from the Chestnut-backed Chickadees.

Field Marks. Their shape, a round bundle of feathers with long tail and no appreciable neck, and the contrastive face marks make them easily recognizable. Except in British Columbia not likely to require separation from anything but the Brown-headed Chickadee. The intensely black instead of brown head and throat marks, and its clearly uttered *"Chick-adee-dee,"* instead of a flatter and hoarser *"Chick-adaa-daa"*, make separation comparatively easy.

Nesting. In old stumps, holes in trees, etc. Nest of moss, grasses, feathers, and plant down.

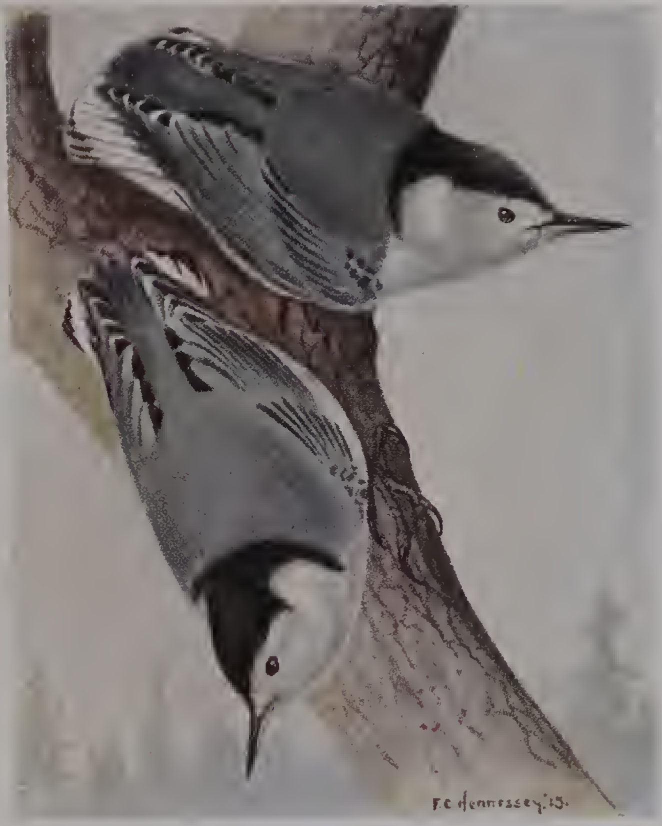
Distribution. North America. In Canada, across the Dominion north to the tree limit.

SUBSPECIES. Three subspecies are recognized in Canada. The Eastern Chickadee *Penthestes atricapillus atricapillus* occurs westward to or near the Manitoba line. The Long-tailed Chickadee *Penthestes atricapillus septentrionalis* continues from there to east side of the Coast range in British Columbia. It averages a slightly longer tail and some very fine colour differences, none of which is constant enough for recognition without a large series for comparison and which are too slight for popular observation. The Oregon Chickadee *Penthestes atricapillus occidentalis* is the Chickadee of the southern British Columbia coast. It is a rather more decidedly marked race, shorter in wing and tail than either of the above, and with slightly darker, more olive, less ochraceous, back.

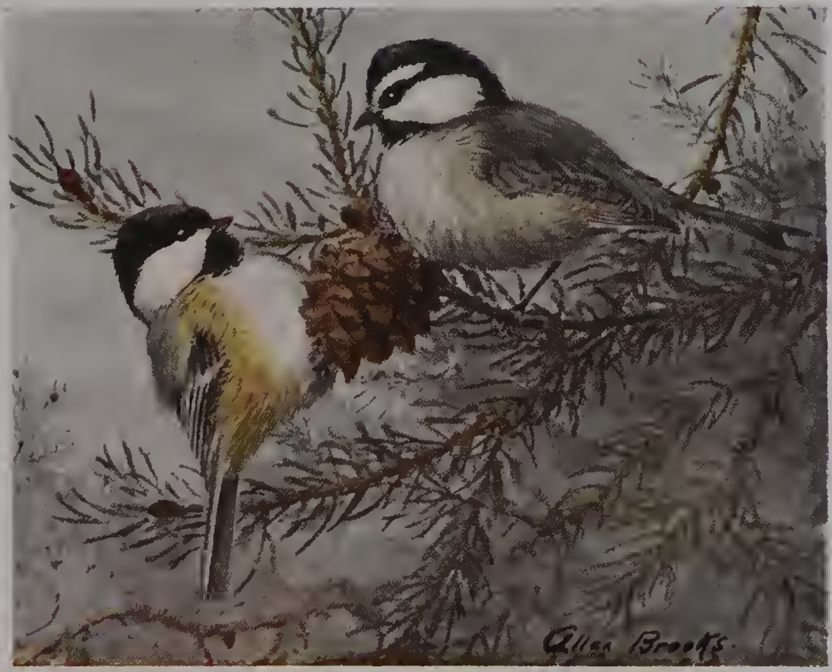
Through the coldest, most blustery, or the wettest and rawest of days, if a Chickadee is to be found, it will be "chickadeeing" as cheerfully as in the brightest weather. A discouraged Chickadee is yet to be seen by the writer. In the autumn and winter when birds are scarce one should listen to its cheery *"Chica-chick-adee-de"*, for it usually leads a little company of congenial spirits cruising through the woods, and its notes seem to form a rallying cry that keeps them together. Thus in the autumn the Chickadee is often the centre of a little host of mixed species of Warblers, Vireos, Kinglets, Nuthatches, and an occasional Downy Woodpecker or a Brown Creeper. After the migrant members have left for the winter, the remaining hardier ones keep casual company until spring when nesting duties scatter them for the season. As spring approaches, the Chickadees remember a new song consisting of two whistled notes, high and clear. The first is prolonged, and the second about two tones lower. It has been translated as *"Spring's here"*.

Economic Status. Few birds are more useful to mankind than the Chickadee. Though small, it is constantly at work, and being with us all winter its good work is continued throughout the year. All insects are very small in their early stages and the little bird that devours a whole cluster of eggs at a gulp may benefit agriculture as greatly as a larger one that makes a meal from one or two large caterpillars or adult insects

PLATE LXXVIII


F.C. Hennessey '15.

A. White-breasted Nuthatch; scale, $\frac{2}{5}$
Male Female


Allan Brooks.

Mountain Chickadee; scale, $\frac{1}{3}$
B. Black-capped Chickadee; scale, $\frac{1}{3}$

but scorns the minute ones. The prying habits of the Chickadee and its companions the Nuthatch, Creeper, etc., and their close examination of the small crevices where many insects hide or hibernate, render their services of great value to the husbandman, especially in winter, when insect enemies are scarce, and the total taken throughout the year by these allied species must be very great. These active little birds demand comparatively large quantities of food to resist the intense cold, and the smallness of their prey necessitates the consumption of innumerable individuals.

The Chickadee's food is 68 per cent insect and 32 per cent vegetable. The former comprises eggs, larvæ, chrysalids, and small insects, largely weevils, and includes some of the worst orchard and crop pests. The vegetable matter is largely small seeds and wild fruit. No charges of damage to cultivated varieties have been advanced. Chickadees can easily be induced to come about the home grounds in winter and with a little coaxing become tame enough even to alight on the person and feed from the hand. A lump of suet fastened to a tree trunk is a never failing attraction to them and ensures their constant visits.

738. **Gambel's Chickadee.** MOUNTAIN CHICKADEE. *Penthestes gambeli.* L, 5. Plate LXXVIII B. Almost exactly like the Black-capped Chickadee but greyer, with less sandy wash on flanks or back, and with a white eyebrow-line.

Distinctions. Likely to be confused only with the Black-capped Chickadee, but see distinctions above.

Field Marks. Like a Black-capped Chickadee with a white line over the eye.

Nesting. In an old woodpecker-hole or natural cavity in stub; nest usually lined with rabbit fur.

Distribution. Mountains of western North America. In Canada, the western mountains, except the coastal slope, north to northern British Columbia.

SUBSPECIES. The Canadian representative as recognized in the American Ornithologists' Union Check-list is the Mountain Chickadee *Penthestes gambeli gambeli.* Birds from the interior and western British Columbia have been proposed as a distinct race, the Short-tailed Mountain Chickadee *Penthestes gambeli abbreviatus.*

So nearly like the Black-capped Chickadee as scarcely to require special mention. It frequents somewhat higher altitudes in summer and at that season the two species are rarely seen together.

739. **Siberian Titmouse.** ALASKA CHICKADEE. *Penthestes cinctus.* L, 5·50. A rather large Chickadee like the Brown-headed, but distinctly different in colour; a greyer brown and the cheeks clear and sharply white, almost meeting across the back of the neck.

Distinctions and Field Marks. As above.

Distribution. Eastern Siberia and Alaska. In Canada, only recorded from near the Arctic coast on Anderson river and the mouth of the Mackenzie.

This species is to be expected only in the high western Arctics and is not likely to be observed elsewhere.

740. **Brown-headed Chickadee** (Including **Hudsonian Chickadee**). *Penthestes hudsonicus.* L, 5·12. Similar to the Black-capped Chickadee, but duller and darker in general tone; cap greyish brown of nearly the same colour as the back; throat patch present but veiled; flanks rufous tinted.

Distinctions. The brownish cap and back and general duller and less contrasted coloration.

Field Marks. A very dark Chickadee with coloration diffused and pattern lacking distinctness. Its characteristic *"Chick-a-da"* note is hoarse, but otherwise similar to that of the common Chickadee.

Nesting. In holes in trees and stubs in nest of moss and felted fur.

Distribution. Northern North America. In Canada, across the Dominion, in the heavy northern spruce forest, except the west coast region.

SUBSPECIES. The subspecies recognized in the Check-list for all of western Canada is the Hudsonian Chickadee *Penthestes hudsonicus hudsonicus.*

The Brown-headed Chickadee is so similar in habits to the Black-capped that further description would be little more than repetition.

741. **Chestnut-backed Chickadee.** *Penthestes rufescens.* L, 4·75. Plate LXXIX A. A Chickadee with dark brown crown and throat, and bright white cheeks. Back and flanks coloured with strong reddish chestnut. Below white.

Distinctions. Our only Chickadee with back and flanks strongly reddish.

Field Marks. A Chickadee with strong red flanks and back. Face mark a comparatively narrow but contrastive white stripe extending well over shoulders.

Nesting. In holes in stubs, lined with rabbit fur, feathers, and other soft material.

Distribution. Pacific Coast region of North America. In Canada, British Columbia, mostly west of the Coast range but locally in the interior southern sections.

SUBSPECIES. The form referred to Canada is the type race *Penthestes rufescens rufescens.*

A bird characteristic of the heavily wooded west coast. There, in the upper branches of the giant firs, the birds may be seen flitting about in true Chickadee fashion, but often so high that it is difficult to separate them from Kinglets. When they come closer their ruddy coloration is quite evident. They have the confiding ways and gentle inquisitiveness of the Black-capped Chickadee and are much like them in habit and action.

743. **Bush Tit.** *Psaltriparus minimus.* L, 4. Like a very small Kinglet in size and perhaps the most inconspicuously coloured bird that we have. Dark brownish grey on back changing to warm sepia brown on crown; below, white, tinged with brownish on flanks. No definite markings anywhere.

Distinctions. With small size likely to be mistaken only for a female Ruby-crowned Kinglet, but without any trace of green, suggestion of wing-bar, or light eye circle. Tail distinctly long and bill very short and stubby.

Field Marks. Probably in life the Bush Tit looks like a diminutive Kinglet with a long tail, greyish instead of greenish, and without wing-bars, light eye circle, or eyebrow stripe.

Nesting. A beautifully woven pouch with entrance hole in the side, suspended from a branch.

Distribution. Pacific coast of North America. In Canada, known only by a few specimens near the coast in the vicinity of the mouth of Fraser river and extreme southwestern corner of the mainland.

FAMILY—SYLVIIDAE. OLD-WORLD WARBLERS, KINGLETS, AND GNATCATCHERS

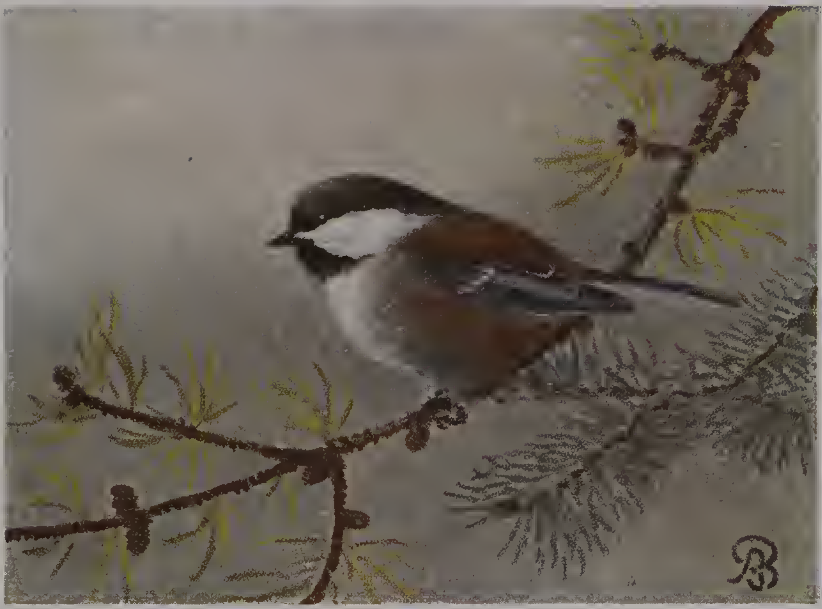
An Old World family represented in America by only a few species. Of these, the Old World Warblers, not to be confused with our Wood Warblers, do not occur in Canada; the Kinglets are represented by two species.

Subfamily—Regulinae. Kinglets

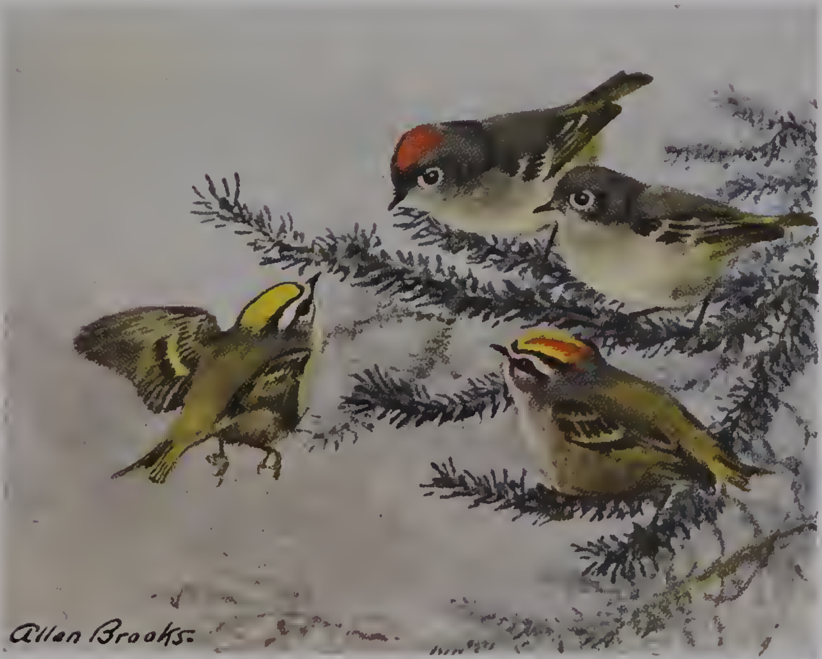
General Description. The Kinglets are, next in size to the rare Bush Tit and the Hummingbirds, the smallest of Canadian birds. They are wren-like in their short, round bodies, but more like Chickadees in their habits and actions. Their colours are dull olive-green, lighter below, and they have small, brilliantly coloured crown-spots of red, orange, or yellow. The bill is small and straight, similar to but not as stout as that of the Chickadee (Figure 68, compare with 67, page 34).

Distinctions. The Kinglets might be mistaken for some of the dull, evenly coloured Warblers, but as all plumages except the female and juvenile Ruby-crowned have brilliant crown patches, this will usually prevent confusion, and size should do so in any event.

Plate LXXIX



A. Chestnut-backed Chickadee; scale, ⅓


Allan Brooks.

B. Ruby-crowned Kinglet; scale, ⅓

Male Female

Golden-crowned Kinglet; scale, ⅓

Female Male

Field Marks. Dull greenish coloration, chickadee-like restlessness and custom of hanging head downward from pendant sprays are characteristic. Their fine, sharp conversational "*Tsee-tsee-tsee's*" soon become familiar and are easily recognized.

·748. **Golden-crowned Kinglet** (Including **Western Golden-crowned Kinglet**). GOLDEN-CRESTED WREN. GOLDCREST. *Regulus satrapa.* L, 4·07. Plate LXXIX B. Diminutive birds, yellowish green above, dull white below. Crown black with large central spot of lemon-yellow or lemon-yellow and orange. Face showing prominent white eyebrow-line against black edge of crown. Juveniles have the characteristic face mark, but are without coloured spot on crown.

Distinctions. The two Kinglets, so nearly alike in size and general coloration, can generally be easily separated by the colours of the crowns. When crown-spots are absent the presence of the white eyebrow and black crown streaks on the face are distinctive.

Field Marks. Very small, chickadee-like birds, often in flocks flitting in and out of the foliage, sometimes up high in the largest trees. Dull, even greenish coloration. The yellow or yellow and orange crown-spots and the black and white eyebrow-lines are the best field marks for the species.

Nesting. Generally in coniferous trees. Nest pensile, of green mosses, lined with fine strips of soft inner bark, fine rootlets, and feathers.

Distribution. Northern North America. In Canada, across the Dominion, north to lake Athabaska and northern British Columbia; rare in the mid-prairie parts.

SUBSPECIES. The Eastern Golden-crowned Kinglet *Regulus satrapa satrapa* extends west probably to the mountains. In British Columbia and the adjacent mountain slopes in Alberta occurs the Western Golden-crowned *Regulus satrapa olivaceus*, showing a slightly intenser green above.

After long, birdless hunting, one may often be surrounded by a large flock of these feathered mites, flitting in and out of the dense foliage and darting hither and thither so restlessly as to make it difficult to see distinctive points. They seem indifferent to the observer's presence and yet more or less attracted to it. Some hang head downward from a swaying bunch of twigs, without regard to horizontal or perpendicular, as they gravely investigate the under surfaces for succulent morsels, and others work in and out on the trunks and branches surveying every crevice with microscopic eye and keeping up a continual interchange of fine, sharp "*Tse-tse-tse's*". For a minute the observer is kept looking this way and that, hardly getting his eye on a bird before his attention is distracted to the next in a most disconcerting manner. Suddenly the confusion grows less, the foliage is empty—the happy crowd has worked away.

749. **Ruby-crowned Kinglet** (Including **Sitka Kinglet**). RUBY-CROWNED WREN. *Regulus calendula.* L, 4·07. Plate LXXIX B. Diminutive birds like the Golden-crowned Kinglet; yellowish green above; dull white below. Crown of male with spot of bright red. No face marks except a vague lightening about the eye.

Distinctions. The two Kinglets, so nearly alike in general colour and size, may be easily separated by the crown and face coloration. The crown-spot of this species is bright red instead of yellow or yellow and orange, and the face never shows a distinct eyebrow stripe or other marking than a dull lightening about the eye.

Field Marks. Very small chickadee-like birds, often in flocks in dense foliage. Dull, even greenish coloration, with evenly coloured face vaguely lightening about eye to a faint interrupted eye-ring; without eyebrow stripe; with or without bright red crown patch. It will be noted that the Ruby-crowned has the habit of fluttering its wings occasionally during momentary pauses in its movement, which is not shared by the Golden-crowned. This, though not an absolute proof of identity, will often suggest the species.

Nesting. In coniferous trees; nest of moss and fine strips of bark neatly interwoven and lined with feathers—usually semi-pensile.

Distribution. Northern North America. In Canada, across the Dominion, north to the limit of trees.

SUBSPECIES. The Eastern Ruby-crowned Kinglet *Regulus calendula calendula* extends west to the east slope of the Coast range in British Columbia. West of this, on the coast, is the Sitka Kinglet *Regulus calendula grinnelli,* of a slightly warmer buff below; and the green above lighter and more extensive.

This species is so nearly like the Golden-crowned Kinglet that little further discussion of either habits or economic status is necessary. Its song, however, is one of nature's surprises and warrants special mention. It is so loud and clear and full throated, that one can but wonder at so much volume proceeding from such a tiny being. It vies in strength and carrying power with that of the Purple Finch and when first heard is likely to be ascribed to some of the larger Sparrows. A very characteristic song may be rendered—*"Peedle-edle-edle-edle - - - Wheedle-wheedle"*—preceded by a low preliminary warble. The last words are accented and loud and ringing, the first syllables are lower and without pronounced carrying power. Like that of other species the song of this Kinglet seems subject to numerous local variations.

Economic Status. The Kinglets are so largely insect-eaters that they may be looked upon as most beneficial. They are small, but their numbers, when they occur, more than make up for their small size, and what is said of the Chickadee in this respect applies equally well to them.

FAMILY—TURDIDAE. THRUSHES AND ALLIES

This is a nearly cosmopolitan group systematically separated with difficulty from the last family, though the individuals described in the following pages are strongly marked enough to be easily recognizable. In western Canada two subfamilies are represented.

Subfamily—Myadestinae. Solitaires

A peculiarly New World subfamily of thrush-like birds. There is only one species in Canada. It is best characterized under its species.

754. **Townsend's Solitaire.** *Myadestes townsendi.* L, 8. Plate LXXX A. A little smaller than a Robin. Nearly solidly grey or brownish grey, with outer tail feathers largely white; semi-concealed tawny spots on flight feathers. The body-feathers of young birds, shortly from nest, have large white centre spots and dark borders producing an effect of a suit of silver scales.

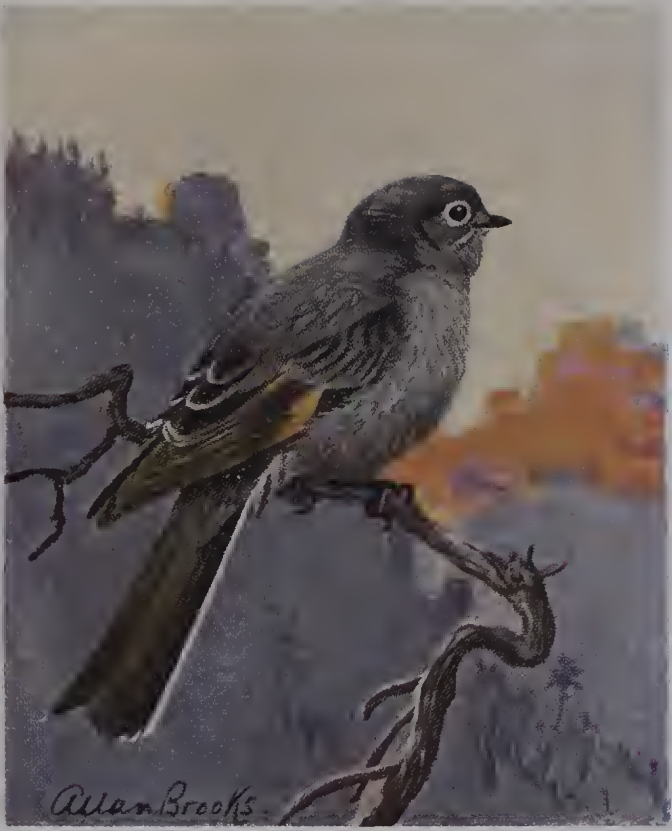
Distinctions. More like a Catbird than anything else it is likely to be confused with, but without black cap or chestnut undertail-coverts; grey-brownish instead of slaty, and large amount of white in outer tail feathers. A fine white circle about the eye and the tawny spots on the flight feathers make the species very distinctive. The Dipper is a solidly grey bird of about similar size, but has a short, stubby tail and none of the above distinctive details.

Field Marks. A quiet acting, comparatively large, dull-grey bird with considerable white on the outer edges of the tail. Looks more like a female or juvenile Bluebird than anything else, but larger, without any vague breast striping, no glint of blue anywhere, a long ample tail, and actions somewhat like a Flycatcher. In flight the tawny wing patches are quite conspicuous.

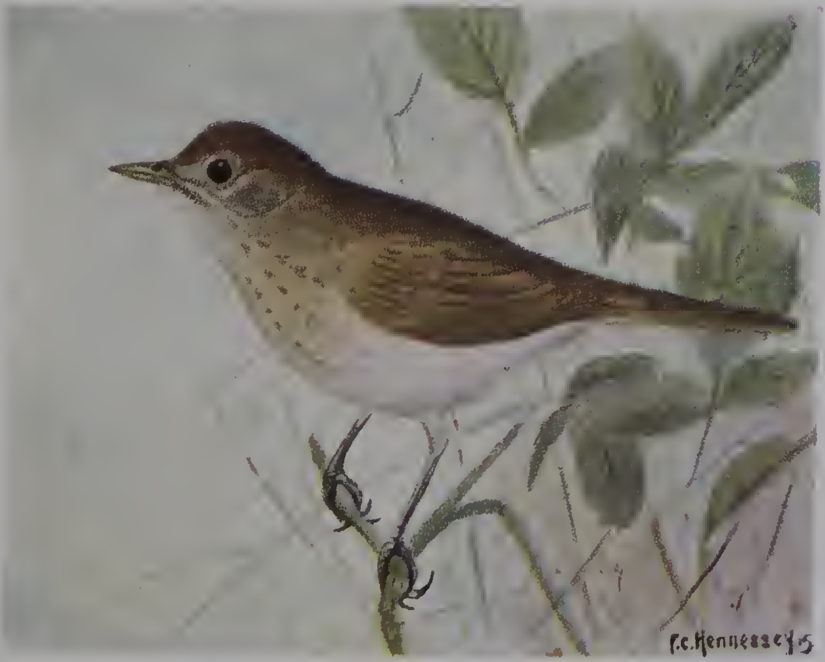
Nesting. In hollow under bank, crannies in rock, or upturned root. Nest of sticks, weeds, and waste vegetation lined with rootlets.

Distribution. Western North America. In Canada, British Columbia north through the Yukon, east to the Alberta foothills and occasionally to Saskatchewan and Manitoba.

A bird typical of the high mountain solitudes, well named Solitaire. Its unobtrusive dull grey colour, glorious song, and romantic habitat and name, surround it with an air of mystery that piques the imagination.



A. Townsend's Solitaire; scale, $\frac{1}{3}$



B. Wilson's Thrush; scale, $\frac{1}{3}$

Subfamily—Turdinae. The True Thrushes

Most of the typical Canadian Thrushes are easily recognized as such. Systematically, they are plainly marked by the number of primaries and the scalation of the feet. As these are rather difficult features for the amateur to discern, it is perhaps easier to differentiate them by other more striking characters that apply to the representatives of the group in Canada. For this purpose they may be divided into the Thrushes proper and the American Robin, including the Varied Thrush and the Bluebirds. The Thrushes proper are medium-sized birds, brown above and white below, with the breast more or less spotted, except one species, the Veery, conspicuously so. Any Canadian bird of this description between 6·25 and 8·30 inches long, with the first primary very small and degenerate, belongs to this group. They are all ground-haunting birds and usually more or less solitary. Their principal food is insects and soft fruit. The woodland species are of little direct economic importance, although their influence is beneficial. All the Thrushes of this group are very sweet singers.

756. **Wilson's Thrush** (Including **Willow Thrush**). VEERY. CATHEDRAL-BIRD. *Hylocichla fuscescens.* L, 7·52. Plate LXXX B. Even, brown-tawny above; white below, with fine, blended arrowhead-spots running down from corners of mouth and spreading across chest.

Distinctions. The lightest tawny of our Thrushes, with only the slightest suggestion of olive in the back. The faintness of the breast spotting will separate it from any comparable species.

Field Marks. The even, light coloration of the back and the light, suffused breast spots. The only Thrush whose song begins on a high note and ends on low ones.

Nesting. On or near the ground, in nest of strips of bark, rootlets, and leaves, wrapped with leaves and lined with rootlets.

Distribution. Southern Canada and northern United States. In Canada, across the Dominion. In the west, including the southern halves of the Prairie Provinces, and southern British Columbia exclusive of the coast.

SUBSPECIES. Two subspecies are recognized in Canada. The eastern form, the Veery *Hylocichla fuscescens fuscescens,* extends west probably to near the Manitoba border and perhaps across it. From there westward the Willow Thrush *Hylocichla fuscescens salicicola* is the prevailing bird. It is slightly more olive on the back and the breast streaks average darker. The distinctions, however, are very slight and of little interest to the general observer.

Wilson's Thrush is the only Thrush generally distributed throughout well-settled parts of the country. In southern Canada wherever there is enough bush land to attract Thrushes, this species is present. Its song is a descending series of short, connected trills, "*Rree-a-ree-a-ree*"; some eight or ten syllables falling about an octave and with a tone like the jingling of a golden chain. Heard at sunset, with the mysterious darkening woods seen against the glorious skies, it has a particularly beautiful and peaceful appeal. It may not have the absolute perfection of the song of the Hermit Thrush or even of the Olive-backed and Grey-cheeked, but it is wonderfully delightful.

757. **Alice's Thrush.** GREY-CHEEKED THRUSH. *Hylocichla aliciae.* L, 7·58. Plate LXXXI A. Even greyish olive over all back; below, white, with breast heavily spotted with brown.

Distinctions. Separated from Wilson's Thrush by the heavy instead of very light breast spotting and more olive cast to back; from the Hermit Thrush by the tail being evenly coloured with the back instead of distinctly redder. Most like the Olive-backed Thrush, from which it is best separated by the greyer cast to the cheeks in which there is little, if any, tawny, or suggestion of eye-ring, and a greyer tone to the breast spotting and flanks.

Field Marks. A Thrush with tail same colour as back, breast heavily spotted and cheeks greyish.

Nesting. In low bushes or on the ground; nest bulky, compact, composed largely of mosses.

Distribution. Northern North America. In Canada, west to the mountains, north throughout the spruce forest; rare on the prairies.

SUBSPECIES. The subspecies for all Canada except the eastern coast is the Grey-cheeked Thrush *Hylocichla aliciae aliciae.*

This Thrush, though so like the Olive-backed, is likely to be confused commonly in Manitoba and occasionally in the other Prairie Provinces.

758. **Olive-backed Thrush** (Including **Russet-backed Thrush**). SWAINSON'S THRUSH. *Hylocichla ustulata.* L, 7·17. Plate LXXXI A. Even tawny-olive over all back; below, white, with breast heavily spotted with brown.

Distinctions. Separated from Wilson's Thrush by the heavy, instead of very light, breast spotting, and more olive cast to back; from the Hermit Thrush, by the tail being evenly coloured like the back instead of distinctly redder. Most like the Grey-cheeked Thrush, from which it is best separated by the distinctly tawny or ochraceous cast to the cheeks, even to showing a distinct eye-ring, and the similar tone to the breast-spotting and flanks.

Field Marks. A Thrush with tail same colour as the back, breast heavily spotted, and cheeks tawny or ochraceous instead of greyish.

Nesting. In bushes or small trees, in nest of mosses, coarse grasses, leaves, and bark, lined with rootlets and grass.

Distribution. North and South America. In Canada, across the Dominion, north to the tree limit.

SUBSPECIES. Unusually enough this species was first described from the west coast, and the type race is the Russet-backed Thrush *Hylocichla ustulàta ustulata,* of the region west of the Cascades and the Coast range. As its name implies, it is ruddier; less olive, the throat is more strongly suffused with ochre, and the spotting is not so strong as in Swainson's Thrush *Hylocichla ustulata swainsoni* that occupies the range eastward.

The next most common Thrush to Wilson's; on the coast the prevailing one at low altitudes, but elsewhere summering more northerly or at higher altitudes. It has a rich, full song only slightly inferior to that of the Hermit Thrush.

759. **Hermit Thrush** (Including **Sierra, Dwarf,** and **Alaska Hermit Thrushes**). *Hylocichla guttata.* L, 7·17. Plate LXXXI B. Even, tawny brown all above, except tail that is distinctly dull red or rusty; below, white, breast heavily spotted with brown.

Distinctions and Field Marks. Has the heavily spotted breast of the Grey-cheeked and Olive-backed, and may easily be told from any other Thrush by its tail being decidedly redder than the back.

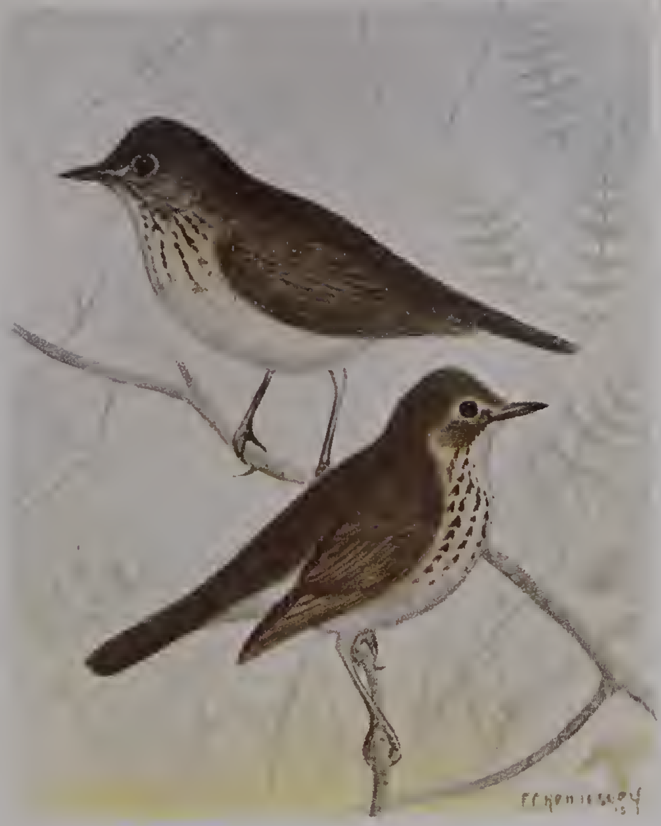
Field Marks. A Thrush with heavily spotted breast and its tail redder than the back.

Nesting. On the ground in nest of moss, coarse grass, and leaves, lined with rootlets and pine-needles.

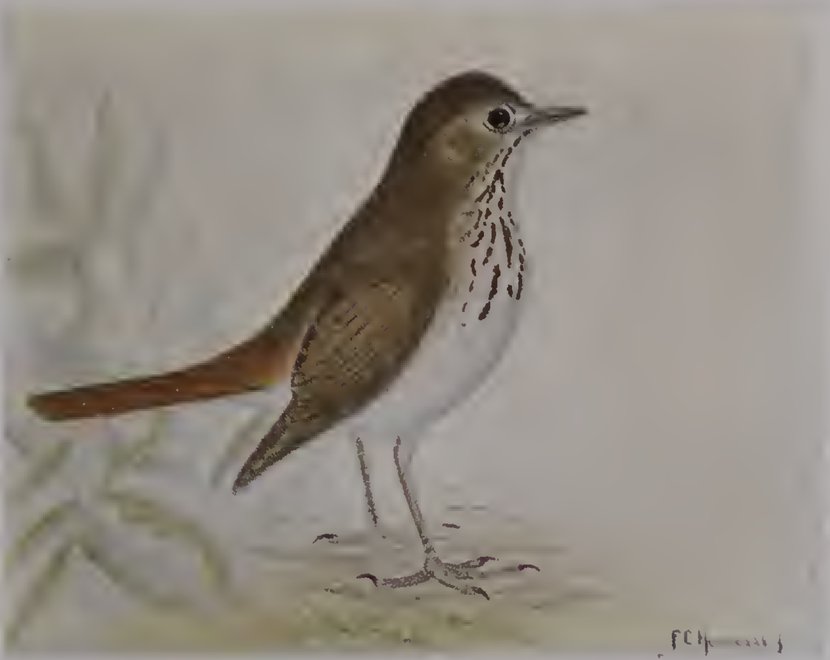
Distribution. Northern North America and mountains of western United States. In Canada, across the Dominion, north to tree limits.

SUBSPECIES. A number of subspecies of Hermit Thrushes are recognized, three of these occurring regularly in Canada. The Eastern Hermit Thrush *Hylocichla guttata pallasi* occurs west to the mountains, crossing them in the north into northern British Columbia and the Yukon. The Sierra Hermit Thrush *Hylocichla guttata sequoiensis* is the bird of southern interior British Columbia. It is as large as the eastern bird, but slightly more olive above and greyer below with less ochraceous suggestion on flanks. West of the Coast range occurs the Dwarf Hermit Thrush *Hylocichla guttata nanus,* which is decidedly smaller and redder. The Alaska Hermit Thrush *Hylocichla guttata guttata,* the type form, for this is one of the few species known first to science from the west—is a subspecies of the Alaskan coast occurring in western British Columbia on migration. It is slightly more olivaceous than the Sierra Thrush and as small as the Dwarf. Audubon's Hermit Thrush has

PLATE LXXXI

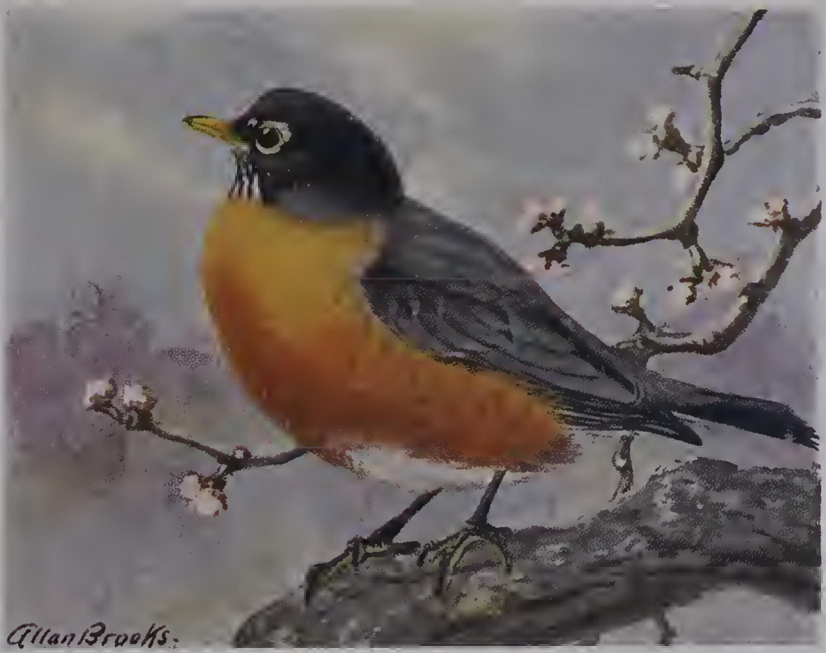


A. Grey-cheeked Thrush; scale, $\frac{1}{3}$
Olive-backed Thrush; scale, $\frac{1}{3}$

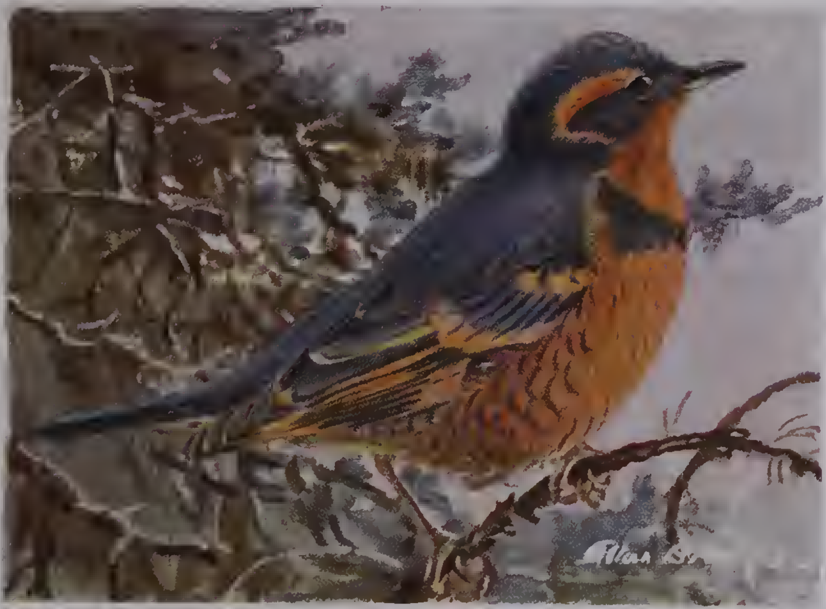


B. Hermit Thrush; scale, $\frac{1}{3}$

Plate LXXXII


Allan Brooks.

A. American Robin; scale, $\frac{1}{3}$



B. Varied Thrush; scale, $\frac{1}{3}$

been accredited to southern interior British Columbia, but its occurrence there has not been verified and is almost certainly an error.

The Hermit Thrush is most notable for its song. Some authorities of world-wide experience have even said it has the purest and most perfect song of any bird. However true that may be, and however many favourite songsters other parts of the world may produce, this species has a purity and richness of tone, and a perfection of execution that is equalled by few other species.

761. **American Robin** (Including **Western Robin**). *Planesticus migratorius.* L, 10. Plate LXXXII A. Almost too well known to require much description. Above, dark greyish-brown, blackening on tail and head, and extending over face to throat where it is broken into short white dashes. All breast and abdomen pure brick red. Young birds have breast spotted with black and flecked with dull white.

Distinctions. Size and full red breast distinguish the Robin too well for mistake.

Nesting. Frequently in fruit or shade trees or about buildings. Nest of coarse grasses, leaves, rootlets, etc., with an inner cup of mud, lined with fine grasses.

Distribution. North America. In Canada across the Dominion, north to the limit of trees.

SUBSPECIES. Canadian Robins are divided into eastern and western subspecies. The Eastern Robin *Planesticus migratorius migratorius* extends west to the mountains. The Western Robin *Planesticus migratorius propinquus* occurs in British Columbia. It is stated to have the white thumb-marks on the outer tail feathers reduced, and the black of the head extending down in a less decided cape over the back. These points are too inconstant, however, for certain individual identification and, as the Eastern Robin occurs throughout British Columbia, on migration at least, the distinctions are rather fine for popular recognition.

Of all the birds of North America there is none that comes into such close and intimate relationship with man as the Robin. Its cheery voice is looked for as the harbinger of spring; it often raises its brood under the same roof that shelters us; and is a constant frequenter of our lawns. Its song is the first sound heard in the grey morning and the last at darkening night. In the late autumn when it has stripped the berries from the rowan-trees and has disappeared, we know that winter is upon us. Though named after that famous Old World bird it resembles the Robin Red-breast only superficially. It has a red breast and confiding habits, but in every other respect it is quite different. Visitors to this country sometimes rather resent our calling such a bird by the name of their childhood's favourite, until they, too, make new associations with it and take it to their heart as do the native born. At any rate it must be remembered that it was originally named "Robin" by Englishmen in remembrance of old home scenes, and not by colonials in a spirit of substitution or imitation. In fact the American Robin has no need to imitate anything or anybody, and has on its own merits carved a place for itself in the affection of the North American people that needs neither excuse nor defence.

The spotted breast of the young Robin is indicative of its thrush-like spotted ancestor. In fact all the members of the family show, in the younger stages at least, this same spotty character that is token of their common descent.

Probably the worst enemy of the Robin is the domestic cat, the pet of the household. Building in readily accessible places the young Robins are subject to many disturbances, are often caused to leave the nest prematurely, and annually great numbers fall prey to the cat. The harm done this way is to our sensibilities rather than to the Robin as a species. Undoubtedly, sleek, well-fed cats are pleasant pets to have about, but so are Robins, and it sometimes takes the nicest adjustment of our sympathies to balance the scale between them. In general, we cannot have both cats and birds close about us, for only very rarely is it possible to teach a cat not to catch birds. The cat is an instinctive hunter, and catching birds is its nature. Of course a well-fed cat will not effect the same devastation as one that has to earn its own living, but not even the best and fattest and laziest of them can resist the stealthy stalk, and rapid pounce, when the occasion offers, even though they afterwards refuse to eat their prey. The cat is still essentially a wild animal; it is with man but not of him, and has never yielded supremacy and control to the human race as has the dog, the horse, and other domesticated animals. It accepts what is offered in the way of physical comforts and takes as much more as it can get. It is, with all its purring grace, daintiness, and pretty ways, thoroughly selfish, and seldom if ever returns a tithe of the affection that is lavished upon it. It is "The Cat that Walks Alone" and follows its wild instinct today as it did centuries ago before it discovered that man's hearth was warm and his protection and food agreeable. In return, it gives unconsciously all it has to offer, its beauty, grace, and playfulness. As a destroyer of vermin it is a failure. In campaigns against rodent carriers of disease it was found useless. At the best it never really clears a place of rats or mice. A few traps intelligently set are much more effective than many cats.

Of course cat-lovers are as much entitled to their pets as are bird-lovers, but they should take care of them. Humanitarians should not be offended by the sight of half-starved hunters, with their gaunt sides and evident misery, rustling for a living, nor should these cats be allowed to devastate bird coverts by their depredations. The elimination of these neglected cats would well merit a vote of thanks from the Robin population.

Economic Status. Though the Robin is an efficient aid to the agriculturist, its fondness for fruit occasionally gets it into trouble with the raiser of small fruit. Forty-two per cent of its food is animal, mostly insects, the remainder is composed largely of berries and other soft, small fruits of which little more than 4 per cent is cultivated fruit.

763. **Varied Thrush** (Including **Northern Varied Thrush**). OREGON ROBIN. WOOD ROBIN. PAINTED ROBIN. *Ixoreus naevius.* L, 10. Plate LXXXII B. About the size of a Robin and very robin-like in general appearance, but strikingly unlike in details of colour. Like a Robin with sharp, black breast-bar, reddish eyebrow-line, wing-bars, and spots on flight feathers.

Distinctions. A breast slightly pale, tawny-red, black breast bar (quite dull in female), distinct light eyebrow streak, and bars and spots on wing. Not to be mistaken for any other species.

Field Marks. A Robin variegated as above.

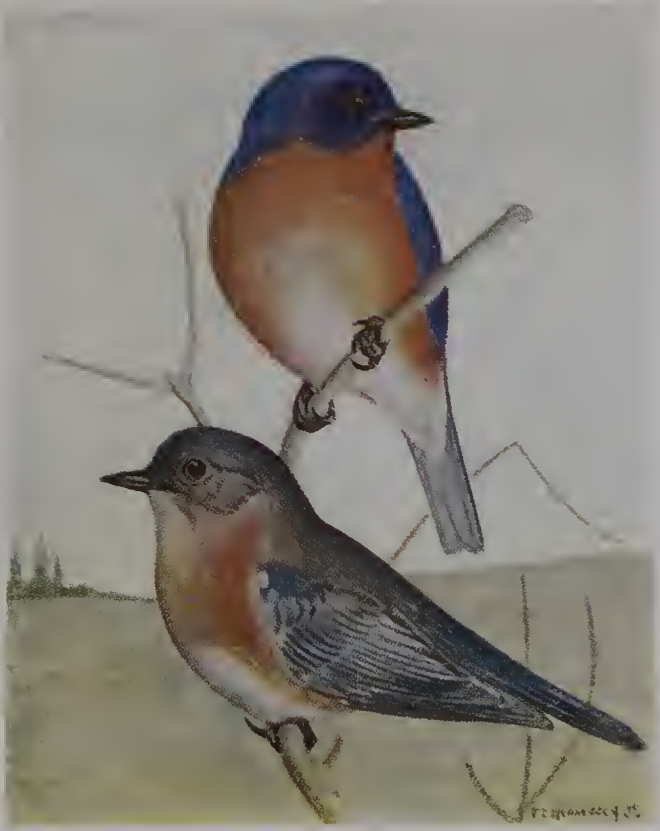
Nesting. In bushes and small trees, nest of moss, sticks, twigs, and rotten wood.

Distribution. Western North America. In Canada, British Columbia and the Yukon, east to the Mackenzie, and adjacent parts of Alberta.

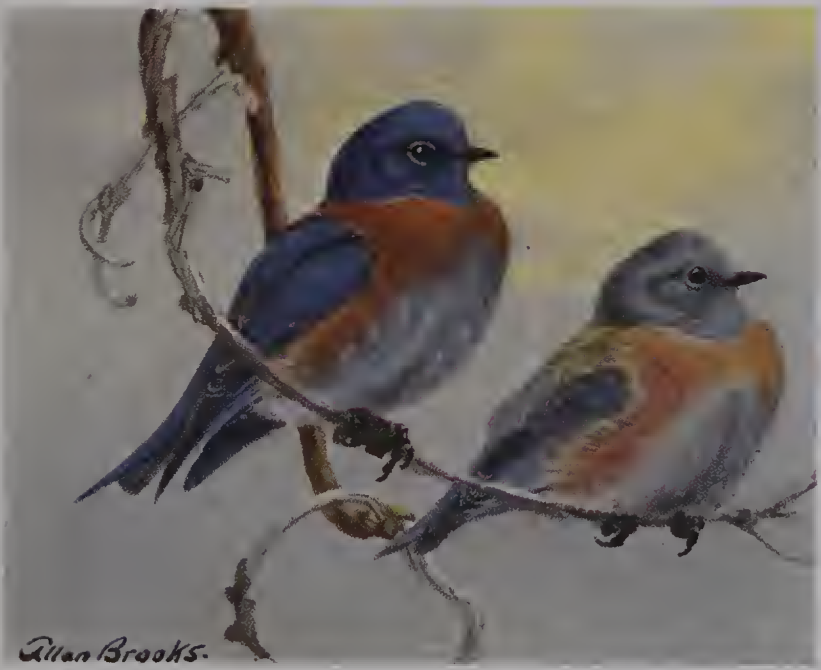
SUBSPECIES. The Varied Thrush of British Columbia and northward toward Alaska is the Southern Varied Thrush *Ixoreus naevius naevius.* That of Mackenzie valley has been described as the Northern Varied Thrush *Ixoreus naevius meruloides,* distinguished by some slight colour differences.

766. **Eastern Bluebird.** *Sialia sialis.* L, 7·01. Plate LXXXIII A. Above, from crown to tail including face, deep sky blue, throat, breast, and flanks chestnut red. Females: similar but duller; juveniles with back largely dark brown with many white flecks, throat spotted with rich brown and white, and the blue only showing strongly on wings and tail.

PLATE LXXXIII



A. Eastern Bluebird; scale, ⅓
Male
Female


Allan Brooks.

B. Western Bluebird; scale, ⅓
Male Female

Distinctions. A solidly blue-backed bird with red throat, breast, and flanks. The Western Bluebird is similar but is a more purplish blue, and the throat is blue as well as the crown. The Mountain Bluebird is a much paler blue, but is also blue on the breast. Adult Eastern Bluebirds are, therefore, easily recognized. Females with more or less red on breast are to be confused only with the western female, the latter, however, has a distinctly grey throat. The breast of the female Mountain Bluebird is dull, light grey-ochre without any hint of red. Juveniles, lately from the nest, are easily known from those of the Mountain Bluebird by the darker tone of the blue on wings and tail, it being dark sky-blue instead of pale blue. Probably sometimes with difficulty separated from the young Western Bluebird, as the colouring of the blue at this age is practically the same in both species. The latter, however, has a suggestion of grey on throat. In practice, however, it is not likely that the Eastern species will ever be confused with the Western as their ranges are not known to overlap.

Field Marks. A blue-backed bird with solid reddish throat, breast, and flanks. In young birds distinguished from the Mountain Bluebird by the deeper tone of the blue most strongly suggested on wings and tail.

Nesting. In hollow trees, posts, or stubs or in artificial nest boxes; nest of grasses.

Distribution. Temperate eastern North America. In Canada, across the southern part of the Dominion commonly to Manitoba, more rarely in Saskatchewan.

SUBSPECIES. The Bluebird of northern North America is the type from *Sialia sialis sialis.*

With the Robin and the Meadowlark in the spring comes the Bluebird, its brilliant coat shining like a jewel against the dead grass landscape, and its low, flowing warble giving promise of pleasant days. In the summer it nests freely in the bird boxes in the garden, the fence-post out in the fields, or the old deserted flicker-hole in the telegraph pole by the wayside. In autumn its musical little warble is forgotten and it confines itself to a low voiced *"Purity-purity"*, usually heard coming down from birds passing high over head.

Economic Status. The Bluebird feeds mainly upon insects and is, therefore, highly beneficial. Weed seeds form an important part of its food and it eats some soft fruit, but practically no cultivated kinds are taken. Hence the Bluebird may be regarded as a consistently useful bird.

767. **Western Bluebird.** *Sialia mexicana.* L, 7. Plate LXXXIII B. Spring male: above from crown to tail, including face and throat, intense, deep purplish blue; more or less complete bar of chestnut across back and shoulders. Breast and flanks rich chestnut red. Abdomen dull blue lightening to white under tail. Female: similar but duller and blue of throat replaced with slate grey. Juveniles have back largely dark brown with many white flecks. Underparts spotted with rich brown and white. Throat slightly greying in general tone. Blue only showing strongly on wings and tail.

Distinctions. A solidly blue-backed bird with more or less chestnut bar across shoulders and back, a blue throat, and red breast. Most like the Eastern Bluebird, but with blue throat instead of red, and the blue deeper and more purplish. The Mountain Bluebird is much paler blue and is solidly and completely blue. Adult Western Bluebirds are, therefore, easily recognized. Females with more or less red on breast are to be confused only with the Eastern Bluebird, but have a slate-grey throat. Juveniles lately from the nest are easily known from those of the Mountain Bluebird by the deeper blue on wings and tail, but probably with difficulty separated from the young Eastern Bluebird as the colouring at this age is practically the same; the Western bird, however, has usually a suggestion of grey tone on the throat. In practice, it is not likely that the Western will ever be confused with the Eastern as their ranges are not known to overlap.

Field Marks. A Bluebird with a red breast and blue throat. Young birds recognized from the Mountain Bluebird by the deeper tone of the blue suggested on wings and tail.

Nesting. In woodpecker-holes or natural hollows in stubs. It takes kindly to nesting boxes.

Distribution. Western North America. In Canada, southern British Columbia. The Common Bluebird of the southwest coast.

SUBSPECIES. The Western Bluebird of Canada is *Sialia mexicana occidentalis.*

In general habit and appearance so like the Eastern Bluebird as to require no special discussion.

768. **Mountain Bluebird.** ARCTIC BLUEBIRD. *Sialia currucoides.* L, 7. Plate LXXXIV. Spring male: all solid, metallic, light sky-blue, paling on head and breast. Lower abdomen white. Female: with blue very much reduced; head, and back with blue veiled with ashy-grey; underparts pale brownish ash, strongest on face and throat; blue showing clearly only on wings and tail. Juveniles lately from nest almost identical with parallel plumage of Eastern and Western Bluebirds.

Distinctions. The all-blueness of the adult male is unlike any other Canadian bird except the Indigo Bunting. It is considerably larger and has a thrush-like instead of a Sparrow bill. Females are distinctive from either of the other Bluebirds by the absence of reddish on breast. Juveniles may be recognized by the paleness of the blue suggested on wings and tail.

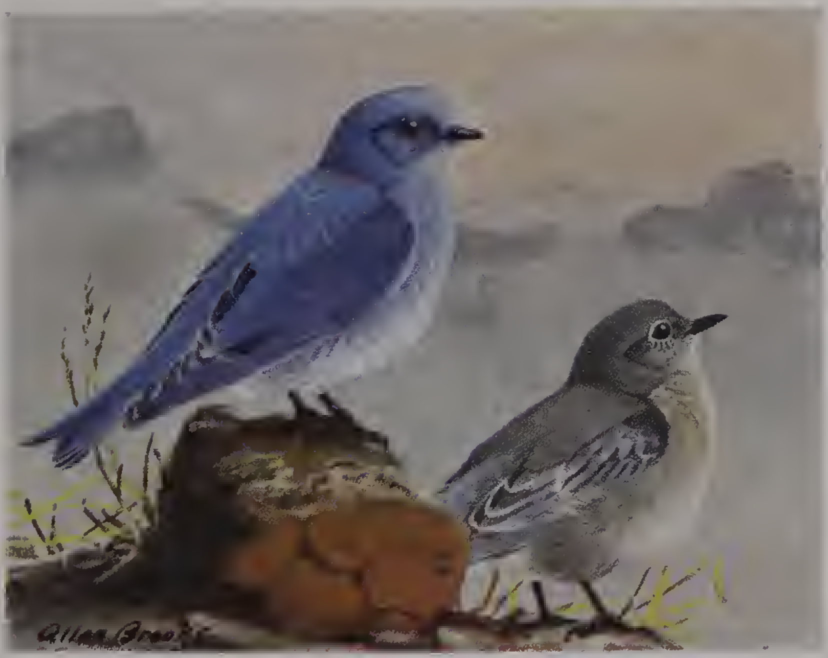
Field Marks. An all-blue bird, markedly larger than the Indigo Bunting. Females: softly, light ashy birds with blue on tail, rump, and wings. Juveniles: brownish ashy, with ashy and light brown spotted or striped breast, and strong blue suffusions on wings and tail.

Nesting. In old woodpecker-holes and cavities in stubs and cliffs, or artificial nesting boxes.

Distribution. Western North America. In Canada from the west coast east to Manitoba, north to the Yukon and Mackenzie valley.

The Mountain Bluebird, a beautiful bird, has been extending east of late and is now well established more or less commonly as far as central Manitoba. It has all the pretty ways and habits of the Eastern Bluebird, but is more cerulean in its coloration. A famous writer has described the Eastern Bluebird as "The sky above, the earth beneath" referring to the blue back and red breast. Following this figure of speech, the Mountain Bluebird is purely celestial with no earthy contamination. It is at home in all kinds of places. In the tree plantations about the prairie homes it will build in the hollow cornices of the buildings or in any kind of a rough box put up for it. In dead stubs at the edge of the prairie bluffs or in old flicker-holes in telegraph poles by the roadside. Even in the austere and repellant, raw-banked coulées of the wildest bad lands it can be found adapting crannies in the rocks and cliffs to its use. Its only requirement seems to be nesting holes and it makes little difference where they are so long as they will shelter a nest.

PLATE LXXXIV



Mountain Bluebird; scale, $\frac{1}{3}$

Male Female

GLOSSARY

Albinism. The occasional and erratic occurrence of white specimens, either pure or partial, complete or in irregular spots, in species that normally are not white. It is nothing more than a freak caused by a deficiency of colouring matter in the plumage *(See* page 6*)*.

Axillars or Axillaries. A fan-shaped group of feathers under the wing closing the space between the innermost flight feathers and the body when in flight.

Bars. In descriptions of bird coloration, bars designate lines across the body and not parallel with the shafts of the feathers *(See* stripes).

Bluff. In western parlance is any isolated clump of trees or patch of woods on the prairies. As so used and as applied in this work, it carries no sense of steep hill-side or rise of ground.

Cere. A wax-like swelling about the base of the upper mandible, present in some species, especially the Hawks. *See* Figure 33 a and b, page 28.

Coulée. Steep, ravine-like valleys cut below the prairie level by streams. They may be quite narrow or a mile or more across.

Coverts. The feathers covering the bases of the larger flight and tail feathers. There are upper and underwing-coverts and upper and undertail-coverts. The upperwing-coverts are divided into greater and lesser coverts, the former being the largest line immediately next to the flight shafts and resembling them to some degree in texture (Figure 1, page 23).

Crepuscular. Pertaining to twilight.

Crown. The top of the head from the forehead to near the base of the skull.

Culmen. This may be called the ridge line of the bill. Viewed sideways, the line forming the top outline of the bill from the spring of the first forehead feathers to the tip is the culmen line. It is measured in a straight line, as with dividers, not following the curves as with a tape line (Figure 1, page 23).

Dichromatism. The normal occurrence of two different colorations in the same species due to neither sex, season, nor age and only partly hereditary. Both colorations may occur in the same brood though the tendency is for like to produce like and one form may predominate in any given locality *(See* page 6*)*.

Emarginate. When applied to the shape of feathers indicates that more or less of one web is cut away as if a shaving had been removed with a jack-knife.

Extralimital. In describing distribution refers to the subject occurring beyond the geographical bounds of the area under discussion.

Family. In zoological classification is one of the larger groups of animals having enough mutual resemblance to be classed together and apart from all other forms. It is the next larger group to a genus and next smaller to an order or suborder. For example, all the Ducks, Geese, and Swans belong to the same family, Anatidae *(See* page 5).

Flanks. The sides of the body, below or under the closed wing. They are often covered by a loose group of feathers that may be laid at will either over or under the shafts of the closed wing (Figure 1, page 23).

Genus (plural, genera). In zoological classification is one of the smaller groups of animals having enough resemblance to be classed together and apart from all other groups of like rank. It is a subdivision of a family or subfamily and next above a species. A genus is, therefore, a group of species, and a group of genera is a family *(See* page 5).

Gular Pouch. A pouch of bare skin depending from the under side of the lower bill between its Y-shaped arms and joining it to the neck below. Some species have only the merest trace of it, and others have it remarkably developed, though in most species it is entirely absent.

Hybrid. The offspring between parents of two different species—a "cross."

Iris. The coloured part of the eye. The pupil, except in albinism, is always black and the surrounding circle of colour is the iris.

Lanceolate. Lance shaped, i.e., long and narrow with parallel edges or tapering gradually to a point.

Length. Abbreviated in descriptions by its initial L and given in inches and tenths of an inch. Length is taken in a straight line, as with dividers, from the tip of the bill to the end of the longest tail feather, the bird being laid out flat on its back and stretched just sufficiently to straighten the curves of the neck.

Lores. A small spot between the eye and the base of the bill (Figure 1, page 23).

Mandibles. The two members forming the bill; thus there is an upper and a lower mandible.

Mantle. A term covering the back, shoulders, upperwing-coverts, and secondaries. Applied more especially to the gulls where the even colouring of these parts suggests a mantle covering the whole upper part of the body and closed wings.

Mast. Soft-shelled nuts, like acorns, beechnuts, etc.

Melanism. The opposite of albinism. It is the more or less erratic occurrence of very dark or black individuals in a normally lighter-coloured species. It usually occurs less frequently than albinism though some species are more liable to it and it glides imperceptibly into dichromatism in some cases. Albinism usually denotes a lack of virility. Melanism does not seem to be an evidence of weakness and hence melanistic strains have better chances of surviving. A melanistic animal is said to be a Melano *(See* page 6).

Nape. A small space at the back of the neck just below the base of the skull (Figure 1, page 23).

Neck. The space between the throat and the breast in front, and between the hind head and shoulders behind. It is divided into foreneck and hindneck whose meanings are obvious (Figure 1, page 23).

Order. In zoological classification a group of families having strong enough mutual resemblance to separate them from all other groups. It is next larger than the family and is the largest subdivision of birds that we have to deal with in Canada *(See* page 5).

Pectinate. Furnished with comb-like teeth. In ornithology usually applied to the claws of some species that are so furnished (Figure 19, page 26).

Pelagic. Living largely or almost entirely at sea.

Pensile. Applied to nests that hang suspended like a bag between the forks of a branch or other such support, with nothing supporting from below.

Primaries. The large flight feathers secured to the first joint of the wing from the wrist to the tip *(See* Secondaries). (Figure 1, page 23.)

Race. As used here, practically synonymous with subspecies. In general, any group within a species exhibiting recognizable common characters differentiating it from others of the same species.

Rufous. Of a red or reddish colour.

Rump. The lower end of the back just before the root of the tail (Figure 1, page 23).

Secondaries. The large flight feathers secured to the second joint of the wing between the wrist and the elbow *(See* Primaries). (Figure 1, page 23).

Slough (pronounced "Slew"). In western parlance any small pond or wet spot on the prairie. They are usually more or less seasonal and may be either clear, grassy, or reed grown. They are not necessarily quagmires.

Species. In zoological classification the smallest constant group. It is the scientific term to denote what is understood in common language as a "kind of animal." Thus a house cat is a species, whether Maltese, tortoise shell, or tabby; the dog, whether greyhound or spaniel is another; and a horse, whether Shetland pony or draught, is a third (*See* page 5).

Speculum. A somewhat rectangular patch of contrasting colour on the centre of the upper surface of the wing. It often shows metallic iridescence and is a common feature of coloration in some families, as in the Ducks.

Stripes. In ornithological descriptions, stripes always run lengthways of the bird; lines across the body are spoken of as bars (*See* bars).

Sternum. The breast bone. In a bird a deeply-keeled structure to which the wing muscles are attached.

Subspecies. In ornithological classification, synonymous with geographical race or variety, denoting a division of the species usually correlated with geographic limitations. It differs essentially from a full species by showing intergradations with allied races of equal rank. Taking the horse as a representative species, the various breeds or strains, such as Arab, Clydesdale, or Shetland pony are subspecies (*See* page 6, for discussion).

Tarsus. The metatarsal bones of the foot fused together into a single bone. This is what we popularly regard as the bird's leg but is properly the foot, extending between the juncture of the toes and the end of the "drum stick." A comparison with the joints of the human leg will make it obvious that the knee is between the "drum stick" and the "second joint" of the fowl and that the first external joint on the bird corresponds with our heel, the "feet" being true toes.

Tule (pronounced "Tu-lee"). *Scirpus* or bulrush, a round-stemmed, reed-like plant growing in the water.

Type. In zoological nomenclature the "type form" is that form first properly described and named and the specimen from which the description was written is the type specimen. It does not of necessity mean that the form is typical in the ordinary sense of the word, though for convenience it is assumed to be so (*See* page 7).

Vermiculation. In descriptions of plumage, vermiculation refers to fine, irregularly wavy lines suggesting the pathways of innumerable small worms, from which the word is derived.

Vinaceous. Wine coloured. A peculiar purplish pink shown or suggested in the coloration of some birds.

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